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SCOUTS' HANDBOOK AND INSTRUCTOR

McKENNEY

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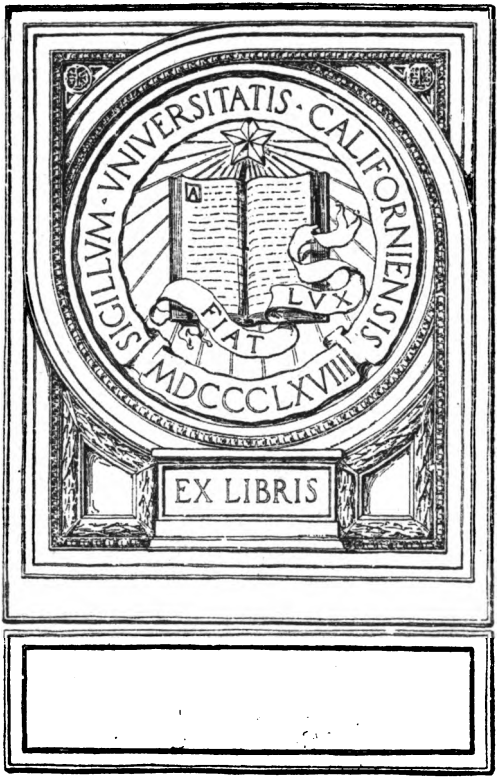

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Scouts' Handbook

AND

Instructor.

BY

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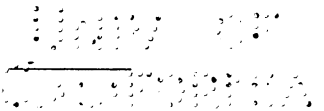

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PREFACE.

It has been the aim of the author to make these pages of use as a reference for both scouts and instructors.

In order to confine the book to a reasonable size, it was found necessary to give the scouts' organization commander credit for having given the scout instruction and training in the duties of a soldier, including some of the special subjects in which instruction is now required, in our service. Also, it will be noticed that attention has been directed to the individual scout and not to patrols. A progressive scheme for instruction has not been attempted.

Access has been had to standard publications and manuals used in the service. The Field Service Regulations, United States Army, 1910, have been consulted wherever the subject matter relates to scouting. Nothing will be found in these pages which is contrary to official publications. When practicable, where subject matter has been taken from the Field Service Regulations, attention has been called to the fact in some way (Example: F. S. R.), so that such data can be followed from these pages as confidently as though taken direct from the Field Service Regulations.

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The author desires to express his appreciation of the valuable assistance rendered by Captain L. C Scherer, Paymaster (Cavalry), during the correction and revision of the manuscript.

H. J. McKENNEY.

Fort Riley, Kansas,
March 21, 1912.

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INTRODUCTION.

MISSION AND QUALIFICATIONS OF SCOUTS.

MISSION OF A SCOUT.

Certain information is gathered in time of peace by the General Staff of the Army. In addition to this, there is certain information which it is necessary for a commander, in the field, to have, and which can be gathered only in the field, in the theater of operations. This information is absolutely essential to a commander in order that he may be able to properly estimate the situation.

In order that an army may be able to accomplish the purpose for which it was sent into the field, it is important that its commander first comprehend his MISSION, and second, that he be in possession of all information which will enable him to form an estimate of the situation.

A full knowledge of all the existing conditions, in the field of operation of an army, must include the following:

(1) The strength, intentions, position, resources, morale, etc., of the enemy.

(2) The topography of the country.

(3) The resources of the country.

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This information is gathered by the troops themselves, in the field, and is accomplished by reconnaissance of bodies of troops, either large or small, according to the nature of the work to be done, by patrols of two or three men or even by single scouts. It is with the latter only that we have to deal.

The effect of the work of one scout on the success or failure of an enterprise, undertaken by the army to which the scout belongs, cannot be too strongly emphasized. Ten men with perception, training, and experience, in a given position, can gain no more information than one man of equal attainments in the same position.

When it is remembered that the plan of a commander for the action of his whole army may be based on information reported by one scout, it is clear that any plans, already made by the commander, may be changed by the report of another scout. If the information reported is meager, the estimate of the situation is partly guess-work and the resulting plan is based on an insecure foundation which may crumble away at the first development for which provision has not been made through a lack of proper information.

On the other hand, accurate information, covering every phase of the situation, properly reported in time to be considered by the commander, will enable the

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latter to make an accurate estimate of the situation upon which to base his plan of operation.

*"In the Russian Cavalry, since the war with Japan, it has been laid down that 'it is *indispensable* that *every* cavalryman must now be trained to scouting.'"

That the importance of mounted scouting is recognized by the War Department of the United States is evidenced by a provision in the Field Service Regulations, 1910, for a "detailed detachment of mounted scouts" for each regiment of infantry.

Therefore, anything which relates to mounted scouting relates to infantry scouting as well as to cavalry scouting.

The necessity of information being gained by scouting having been established, we will say that the MISSION of a scout is: *To get the required information and report it to the proper authority in time for it to be of use.*

QUALIFICATIONS OF A SCOUT.

There are certain qualifications which a man detailed as a scout should possess before entering upon his training. These qualifications are both natural and acquired.

*"Aids to Scouting," by Lieut. Gen. Sir R. S. S. Baden-Powell, C.B., F.R.G.S.

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Natural Qualifications of a Scout may be briefly summed up as follows.

(1) He should be physically well developed and free from disease. Excellent eyesight and hearing are of the utmost importance.

(2) His habits should be good, so that neither his body, his mind, nor his reliability are impaired by them.

(3) His education should be such that he can, at least, read and write and figure simple problems in arithmetic.

(4) He should have a good memory.

(5) His intelligence should be such as to enable him to learn quickly and to observe accurately.

(6) His character and judgment should be such that his determination to carry through to a successful termination an enterprise, when once undertaken, will be affected by nothing except the most insurmountable obstacles.

(7) His fidelity, truthfulness, and physical courage should be unquestioned.

The duties of a scout, at times, necessitate his being separated from his companions, generally in the

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enemy's country, where he can rely only on his own resources and expect help from no one. The existence of any physical or mental disability in a scout, under such conditions, may result in his capture or death.

A dead scout is of no value either to himself or to his army. His death may prove to be an injury to his army. His mission has not been carried out and the final act of his life has resulted in *failure*.

His education, memory, intelligence, character, judgment, and courage are of the greatest importance in aiding him to obtain, estimate, comprehend, remember, and report information properly.

Acquired Qualifications of a Scout are those which he possesses from his ability to do certain things that have been taught him. They include his ability to do everything a good soldier can do. Some of these things I will particularly mention in addition to mentioning an ability to do some things which are not required of every soldier in the ranks.

**Acquired Qualifications:*

(1) Ability to cook.
(2) Ability to swim.
(3) Ability to swim his horse.

*It is assumed that the scout has the "Acquired Qualifications" mentioned. Therefore, in the following pages, no attempt will be made to give instruction in subjects appearing under this heading.

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(4) A good horseman.
(5) Ability to put a fitted shoe on a horse.
(6) Ability to signal (flag and heliograph).
(7) Ability to read a map.
(8) Ability to make a fairly accurate map.
(9) Ability to give first aid.

Many men whose courage is unquestioned can be found who, actuated by a spirit of adventure or an earnest desire to fulfill their duties to their country in time of need, are desirous of becoming scouts. But without training they are worse than useless.

However, only when a man has obtained possession of all of the natural and acquired qulifications of a scout mentioned above is he fitted to receive the special training which will equip him for the particular and important duties of a scout.

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CHAPTER I.

READING SIGNS AND ASKING QUESTIONS.

READING SIGNS.

The country is like an open book. Information is there in the form of signs. They only need to be read. What are signs and what they mean you must learn for yourself, in a great measure. Much practice and actual observation are necessary. You must see things and reason backwards to find out what they mean. Everything may have some signficance. The flight of birds, excitement of cattle in a field, a stone with the moist side up, all mean something.

Telling you about these things will only serve to make you think along lines which will help you in working out the particular problem which you have before you. No amount of description of a sign will serve to impress it on you, or make it appear as clearly to you as finding it and reading it yourself.

Conditions and circumstances are seldom twice the same. Although the same sign may appear the same at different times, its significance may be different according to its bearing and relation to your particular problem. It is useless to attempt to discuss all conditions and circumstances which may arise while scout-

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ing. The following are a few suggestions as to the significance of signs:

Signs. *Significance.*

ANIMALS.—Their former presence can be told from the tracks their claws and paws or hoofs make on the ground and from their droppings. When they were there may be told from the age of the tracks. (See Age of Trails, page 42.)

BELLS.—On the approach of troops to a town, the violent ringing of bells may be a signal to an outlying enemy that troops are approaching. Or it may have some other significance. It should be especially noted if they are rung at an unusual time and simultaneously with the approach of troops.

BIRDS.—The hurried rising and flight of birds, from an unseen position, may indicate an unseen presence.

BLOOD.—Bloody bandages or other articles indicate that some one or some animal has received a wound. Indications of blood should be looked for when examining any place formerly occupied or passed by the enemy, after a battle, in order to ascertain if many of the enemy have been wounded.

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BOATS.—Large numbers of boats collected at a particular place on one bank of an unfordable river may mean that an unusually large number of persons intend to cross—possibly the enemy. If there are no boats at places where they are usually kept in large numbers, the enemy has probably taken them, maybe destroyed them, to prevent the advance of the (our) army. Also, the enemy does not intend to reoccupy that territory.

BRIDGES.—The destruction, by the enemy, of bridges over large rivers probably indicates a retreat with no intention of returning to that territory, and an attempt to delay a pursuing army.

BUZZARDS.—Large numbers of buzzards, or other carrion birds, hovering over a place, may indicate a a more or less recent battlefield.

CAMPS.—Abandoned camping-places may be discovered by the evidence of former locations of picket-lines; fires (see Fire, page 18); trenches for drainage, latrines, and the disposal of other waste.

If tents were used, the ground which has been occupied as a camping place for some time will show where tents have been banked or ditched and the remains of improvised shelters and camping expedients may be seen. Also, ground lately abandoned will show tent peg holes.

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Unless manure has been burned or disposed of otherwise, piles of manure will be found in the vicinity of camping places occupied for some time.

Graves will not always be seen, even in camps of long standing or when occupied immediately after suffering losses in battle. In order not to disclose losses and to prevent bodies from being disinterred by animals, the bodies are frequently buried in a line. A picket line is then established over the graves and the horses and mules allowed to stand over them. (See Camp Sites, Observation of Old, page 81.)

CATTLE.—Cattle or other domestic animals grazing quietly show there is no unusual presence in their vicinity. If they run from a place, stop and look in a certain direction, bellow, or show other signs of nervousness and excitement, they have been disturbed by an unusual presence and the presence is in the direction they are watching.

CLOTHING AND EQUIPAGE.—"Abandoned clothing and equipage may bear marks indicating organizations." (F. S. R.)

GRAVES.—Numerous newly made graves near an old camp of the enemy are indications of the enemy's losses.

GRASS.—Grass will show where forms of men have

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been lying for a time. It may show a recent bivouac or protracted halt or temporary resting place. From the extent of space covered, the strength of troops which occupied it may be estimated. Inside the edges of tall grass indications of former outposts may be seen.

DUST.—"A thick low cloud of dust indicates infantry; a high and thin cloud, cavalry; a broken cloud, artillery or wagon trains. The size of the command and direction of march may be roughly estimated by the dust, but the effect of wind must be considered." (F. S. R.)

Do not mistake clouds of insects, in the air, for dust.

ENEMY.—When no accurate information regarding the intentions of the enemy can be gained, give him credit for having good sense. He will probably show excellent judgment.

EXPLOSIONS.—Explosions in the direction of the enemy which are not artillery fire probably mean the destruction of stores. This would generally precede a retreat.

FENCES.—Even a splinter freshly knocked off, as well as larger breaks, would indicate that someone had crossed or had mounted the fence. Look for foot marks on the ground.

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FLASHES OF LIGHT.—Flashes of light (by reflection—observed when you are still) mean the movement of something—generally a person. The person is most likely to be a soldier.

FIRE.—The habits and customs of people who use fire must be known, to some extent, in order that the significance of fires built by them may be determined.

Ashes and cinders of fires will appear old immediately after a rain although the fires may not be long dead. Feel underneath the ashes for heat, and smell the cinders.

The amount of ashes and cinders will give some idea of the length of time the fire was used.

The size and positions of fires will indicate the purpose for which the fires were built.

The state of decay of food around former cooking fires will aid in determining when the fire was abandoned.

Fires burning at unusual hours in camp denote unusual circumstances, such as a preparation for departure, the destruction of stores; and at night they may be burned to give light to working parties.

Fires may be lighted successively in a line and left by the enemy, when abandoning a camp or

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other position, in order to create the impression that the place is still occupied. However, fires may be lighted in this manner by organizations coming into camp successively.

In estimating the strength of a command by the evidences of fires, the amount of ground covered by the fires must be considered rather than the number of fires. In warm weather fires will generally be limited to those used for cooking and possibly a few for illuminating at night. In cold weather the fires will be more numerous, possibly one to each shelter, but the amount of ground covered by them would not be greater than when they were used for cooking and illuminating alone.

FOOD. — Food abandoned at an old camping place means a plentiful supply. Fresh cooked food abandoned would indicate a hasty departure.

FOREIGN MATTER.—Any articles foreign to their surroundings indicate they were placed there by someone or something. Their nature taken in connection with their use may give a clue to a former presence.

HORSE.—(See Horse, page 46, and Appendix A, page 144.)

INHABITANTS.—If in friendly territory, much information can be gained from inhabitants.

If in hostile territory, when the inhabitants ap-

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pear friendly but frightened, they probably have no faith in the ability of their own troops to protect them; their own troops may be at a distance; or they may not be wholly in sympathy with the war. Confidence and insolence may mean the proximity and anticipated arrival of their own troops.

If in uncertain territory (uncertain as to the loyalty of the inhabitants), when towns, villages, and hamlets are abandoned on the approach of troops, or only a few women, children, and old men are left, the inhabitants are friendly to the enemy. The men have probably joined the enemy's army.

LOCOMOTIVE WHISTLES.—A long whistle generally indicates arrival. Short sharp whistles generally mean departure. (See Whistles of Locomotives, Appendix A, page 150.)

MOISTURE.—If anything seen lying on the ground has the moist side up and the side next to the ground dry, it has been moved lately and turned over.

MORALE.—Anything which denotes cheerfulness, confidence, or that the troops were well in hand, would indicate that the morale was good. Whistling, singing, laughing, requirements of sanitary conditions observed, an orderly arrangement of

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troops in camp, no straggling of troops on the march, are all indications that the morale is good.

MULES.—A general braying of mules would indicate that they were coming to the end of their journey or preparations were being made to feed them. (See Mules, page 47.)

NOTHING.—You have learned something when you realize that you have seen nothing and that there was nothing to see.

OUTPOSTS.—A study of signs around an old camping place of the enemy which indicate the positions of former outposts will show the enemy's outpost system. It may be useful knowledge to have when observing an occupied camp of the enemy.

SMOKE.—Distant smoke indicates a village, a signal, a camp, or at least some human presence, except where forest or prairie fires are prevalent.

TOBACCO SMOKE.—The smell of tobacco smoke will easily convince you that someone is near. Small, more or less regular puffs of smoke, rising from behind a hedge, wall, close fence, mound, etc., would denote the presence of a man smoking.

WAGONS.—The usual noises made by and which accompany the movements of wagons, horses, or mules, such as the shouting of drivers, etc., would denote at least the movements of wagons. They

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are probably returning with supplies if there is no indication of a movement in the camp which they are entering or which they are approaching.

If there are indications of a move in a camp and the wagons are getting away before the movement of the troops begins, the enemy are probably getting their supplies on the road first and intend to retreat or withdraw toward a friendly force. (See Wheels, page 51.)

WATER.—Ground softened by moisture around watering places will show plain indications of tracks.

Watering places may be located by following wild animals' tracks or tracks of domestic animals in the fields. A bird alighting may possibly show where water may be found, if the surrounding country is very dry. Look in low places for water. A hole dug in low damp ground may collect enough water for a small party. Some large vines in the tropics, if tapped or cut in two, give a small supply of pure cool water. You had better know your vine, however.

ASKING QUESTIONS.

One of the most valuable and natural means of gaining information is to ask questions. The value of the information obtained will depend on whether the person questioned knows the correct answer; if

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he does, whether he will tell it and whether the question has been asked properly.

In remote districts, the ignorance of the average farmer regarding the surrounding country is astonishing. Answers by different people to the same question will disagree frequently. The farmer generally knows the way to the nearest post-office, town, or railroad. There his travels and knowledge of geography and topography cease. If you ask him how far it is to any of these places, he will probably stop, think, try to estimate it, and wind up by guessing.

Country doctors, horse traders, cowboys, country traveling salesmen, rural free delivery postmen, etc., will frequently be found to have a fair knowledge of distances, locations, etc., because their business takes them about the country.

The average civilian is confused by military terms, and such terms should be avoided when describing anything to them or asking them questions.

THINGS TO REMEMBER WHEN ASKING QUESTIONS.

(1) Ask only one question at a time and ask it in one direct sentence.

(2) Wait for the answer to one question before asking another.

(3) Do not ask your question in such a way as to

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suggest the answer. Make the person you are questioning think.

(4) It is sometimes necessary to precede a question by an explanation.

(5) If the person you are questioning is excited or frightened, his answers may not be accurate, but he will probably not attempt to deceive.

(6) Do not put too much reliance in the accuracy of answers given by civilians about matters entirely military.

(7) Persons know distances in the relation certain places, well known to them, bear to some other place. Country people generally have no idea of reckoning or estimating distances.

(8) If you stop a man on the road and ask him how far it is from where you have met him to some other place, his answer will probably be incorrect.

(9) Distances from one town to another town are generally well known in the towns concerned, but not by a man living on a road that runs to either one of the towns but does not connect them.

(10) Do not put too much faith in the truth of answers given by inhabitants of a hostile country. Weigh those answers with what you know yourself, anl be suspicious of them.

The following are a few ways that questions may

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be asked. A glance at them will tell why one way is correct and the other is not.

Incorrect:	*Correct:*
(1) Is it two miles to X...?	(1) How far is it to X...?
(2) Did you see a cavalry patrol pass here?	(2) Did you see any soldiers on horseback go by here?
(3) Did they pass at such and such a time?	(3) How long ago did they pass?
(4) If I go up here two miles and turn to the left, will I get to Y...?	(4) Tell me how you would go from here to Y...?

Familiarity with the customs, habits, and ways of thinking of the inhabitants is a great aid in getting information from them and in understanding what they mean. Here is an example: Some tribes in the Philippines, when asked how far it is to a place, will point to the sun and then point to another place in the sky, in the track of the sun. They mean, if you keep on going at your present rate, when you get to your destination the sun will be in the position in the sky to which they pointed the second time. Others will say:

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"Dos cigarillos" ("Two cigarettes"). They mean, if you keep moving in that direction, that when you have smoked two cigarettes you should be there. Also, there are some natives there who point with their lips instead of with their hands.

When holding conversation with civilians, whether of your own country or the enemy's, it is well to remember the following paragraph in the Field Service Regulations:

"Unless instructions have been given to spread false information, all persons connected with the military service are forbidden to discuss the military situation, plans, movements, etc., with, or in the presence of, civilians of any age, sex, or nationality."

Therefore, "In questioning civilians caution is observed not to disclose information that may be of value to the enemy." (F. S. R.)

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CHAPTER II.

ESTIMATING AND MEASURING DISTANCES AND HEIGHTS.

When in the field you will probably have little time to pace distances or measure heights, so it will be necessary to estimate them. Distances and heights may be of great importance in the report which you make.

A certain amount of "Estimating Distance Drill" is given in the preliminary training for target practice. This is not sufficient practice for a scout. The same ground and the same objects look different under varying conditions. You should practice estimation of distances and heights constantly, so that you will be able to make allowances for changed conditions. You can then check your estimates by some methods I will show you.

In the "Provisional Small Arms Firing Manual, 1909," effects of light and varying ground on the appearances of distances and objects are given. I will repeat it here so that you can use it in your practice.

"Objects Seem Nearer:

(*a*) When the object is in a bright light.

(*b*) When the color of the object contrasts sharply with the color of the background.

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(*c*) When looking over water, snow, or a uniform surface like a wheat-field.

(*d*) When looking from a height downward.

(*e*) In the clear atmosphere of high altitudes.

Objects Seem More Distant:

(*a*) When looking over a depression in the ground.

(*b*) When there is a poor light or fog.

(*c*) When looking from low ground upward toward higher ground."

METHODS OF PRACTICING.

In practicing you must have some known distance and height, with which you are familiar, firmly fixed in your mind. Have a mental picture of it. You can then use it for a unit of measure which you can lay off, in your imagination, on the distance and height you wish to measure. The length and height of your barracks will do very well for this *

First Method.

Observe the distance or height to be measured. You are sure that it is not more than a certain distance and not less than a certain distance. Take the middle distance between these two points and make that your estimate.

*See Measures, Appendix A, page 145.

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Example.

It is not more than.....150 yards.
It is not less than.....100 yards.
Estimation (middle distance).125 yards.

Second Method.

As the nearest half of a distance to be judged is more easily and accurately estimated than the farthest half, you may do this:

Select a point which you think is one-half the total distance. Estimate the half closest to you by the first method, given above. Multiply this by 2. The answer will be your estimate for the whole distance.

Third Method.

If you have several men with you, get their estimates and your own. Then take the average of all of them. That will be your estimate.

Example.

My estimate .....500 yards.
Pvt. Smith's estimate.....480 yards.
Pvt. Jones' estimate.....550 yards.

Divide by number of estimates..3)1530

Final estimate .....510 yards.

Distance may be estimated by sound. This can be

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used only for long distances under the following conditions:

(*a*) When the sound is great enough to be heard from where you are.

(*b*) When the origin of the sound can be observed as well.

An example of this is the firing of a field piece. Sound travels at the rate of about 366 yards per second. Note the number of seconds between the time you see the piece fired until you hear the report of the discharge. Multiply 366 by this number of seconds and you have the distance in yards you are away from the field piece. This is not very accurate unless you use a stop-watch, and even then it will be hard to catch the exact number of seconds and fractions of seconds.

CONSTRUCTING RIGHT ANGLES.

A little knowledge of how to construct angles by scratching them on the ground may well be learned here. Your lariat, picket pin, and a few sharp stakes will do for your instruments.

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To Construct a Right Angle at the End of a Line of Sight.

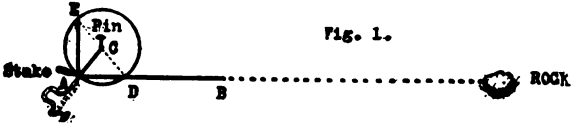

Fig. 1.

Let from A to the Rock be the line of sight.

Required: To construct a right angle to line A, D, B, Rock (line of sight) at A.

Scratch your line of sight on the ground for a little way with a sharp stake (say 4 or 5 yards) to B.

Take any convenient point, not on the line of sight, and a little nearer to the Rock than A, such as C.

Drive your picket pin, with lariat attached, into the ground at C.

Pull your lariat tight from the picket pin at C to the end of the line of sight at A.

Hold against the lariat with your hand a sharp stake at the exact distance from C to A.

Scratch in the ground with your stake a circle around C as a center which will cut the line of sight at D and pass over the end of it at A.

Scratch a straight line from D to C and continue it until it crosses the circle at E.

Scratch a straight line from E to A.

The line E. A will be at a right angle to your line of sight at its end A.

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To Construct a Right Angle on a Line of Sight.

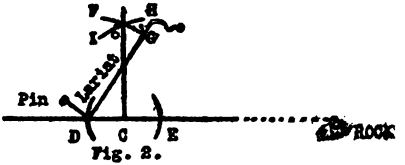

Fig. 2.

Let D, C, E, Rock be the line of sight.

Required: To construct a right angle to the line of sight, D, C, E, Rock at C.

Scratch your line of sight on the ground for a little way, as D, C, E.

Drive your picket pin, with the lariat attached, into the ground at C.

Take any convenient distance on your lariat, such as C, D.

Hold a sharp stake against your lariat at the distance C, D.

Scratch an arc of a circle on the ground at D, crossing the line of sight.

Do the same thing with the same distance on your lariat at E.

Drive your picket pin, with the lariat attached, into the ground at D.

With a distance on your lariat greater than C, D, describe an arc of a circle on the ground, as F, G (position of lariat and pin in Fig. 2).

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Do the same thing with the same distance on your lariat with the picket pin driven in at E.

These arcs will cross at O.

Connect O, C with a straight line.

The line O, C forms a right angle with the line of sight, D, C, E, Rock, at C.

I will now show you some methods of checking your estimates. When in the field you can also use them to get more accurate measurements than you could get by any amount of estimation, provided you have the time.

MEASURING DISTANCES WHICH CAN NOT BE PACED.

Required: To find the distance from the rock to the tree on the other side of the river in Fig. 3.

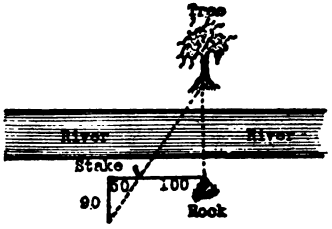

Fig. 3.

Pace away from the rock on a line at right angles and to the left of a line drawn from the rock to the tree. When you have paced any convenient distance, say 100 paces, stop, drive a stake or in some way mark

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the place. After marking the place, go on in the same direction, but pace only half as many paces as you did first. It would be 50 in this case. Turn to the left, pace on a line at right angles to your original line until you can see the tree over the stake or whatever marking you left at your first halt. The number of paces you have come from the time you turned to the left is one-half the distance from the rock to the tree. If you came 90 paces, the answer would be as follows: 90 x2 equals 180 paces—dis. from rock to tree in paces.

32 Say your pace is 32 ins. long.

360
540

12)5760

480 feet=Distance from rock to tree.

MAP-MAKER'S METHOD.

Plot a base line any convenient length, just as you would if making a position sketch of the ground which includes the distance you wish to measure. Use any scale you wish. Plot the required distance by sights from each end of your plotted base line, as in map-making. Then take your scale and measure the required distance on your plot.

METHOD OF MEASURING HEIGHTS.

Required: Find height of pole. (Fig. 4.)

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Plant a stick, the height of which you know, any convenient distance from the object you wish to measure.

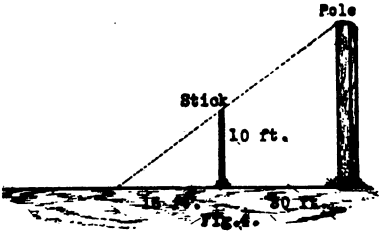

Fig. 4.

Go away from the stick and object measured and find the place where by putting your eye to the ground your line of vision will just cut across the top of the stick and the object measured.

Measure the distances from your eye to the foot of the stick and from the foot of the stick to the foot of the object measured.

Multiply the height of the stick by the distance from your eye to the foot of the object measured. Divide this by the distance from your eye to the foot of the stick.

Taking the measurements given in the figure, we find the height of the pole as follows:

15 plus 30 equals 45, total distance from eye to pole.

45x10 equals 450 divided by 15 equals 30 feet.

Note.—The reason for this is the following proportion: 15 : 10 :: 45 : Height of pole.

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MAP-MAKER'S METHOD OF MEASURING THE HEIGHT OF HILLS.

To find the height of a hill which has an even continuous slope and which can be paced.*

By means of a slope-board (see inside of back cover of this book), determine in degrees the slope of the hill of which it is desired to find the height.

Measure the distance by pacing, from the point you took your sight with the slope-board, to the top of the hill.

Lay off or plot this distance on a piece of paper, using the 3-inch or the 6-inch scale, as you would lay off any distance when making a map.

Lay your scale of map distances on the line drawn on your paper. Find how many contour intervals would be placed on a sketch representing the slope observed.

Multiply the number of contour intervals found by 20, if the 3-inch scale was used, or by 10, if the 6-inch scale was used.

The result will be the height of the hill, in feet, from where you made your observation.

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*Either the above or the preceding method may be used for hills of uniform slopes. The preceding method must be used for hills the slopes of which are uneven and are broken by dips, hollows, etc.

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CHAPTER III.

TRAILING.

Trailing is a subject regarding which little can be taught, but much can be learned by observation. You may grow old at trailing and learn something new about it just before you die. A few suggestions, however, may be of assistance in directing a line of thought and observation.

All human beings, animals, and inanimate objects which move or are moved about on the ground leave more or less evidence or signs of their having been there. One of the greatest of these is disturbances on the ground in the form of indentations which show the form or some characteristic of the object which made them.

In addition to tracks and ground conditions, there may be other indications of the presence of a trail, which are more or less apparent. Frequently it takes a very practiced eye to discover such indications. But there may be others more plain, such as: bushes, branches and twigs being broken in a certain direction, or disturbed places in high standing crops like wheat or any close-growing vegetation, as tall cogon grass, fresh broken vines in a jungle, etc.

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In picking up a trail, indications of tracks must be looked for as in reading any other signs. Trailing is simply reading these signs and following them from point to point.

After a trail is picked up it is not always best, while following it, to look directly at each separate sign on the ground, but to look a little distance ahead. A difference of light and shade can be seen better in this way and the trail becomes more continuous as well.

If you lose sight of any actual signs and think that you are "off the trail," reason which way the trail would be most likely to go. While doing this, bear in mind anything you may know of the characteristics of what you are trailing. If you have any men with you, stop them. While running around looking for tracks, they may destroy them. Have one man look for some distance in the direction in which the trail might be expected to go. If this fails, have one man walk in circles around the place where you lost the trail, or do it yourself. These circles may be widened and signs eventually found. Look for places which would be likely to show indications of signs, such as moist places in the ground. If this fails, go back to where you knew you were on the trail, and repeat all these methods.

In addition to looking for evidences of trails on roads and paths, look for them in such places as holes

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in fences, around watering-places, and shade of trees or other resting-places.

DIFFICULT TRAILING.

Naturally, very hard substances, such as hard-packed roads, hard-baked clay, frozen ground, pavement, etc., do not readily receive or show impressions made on them. But if there is a layer of any other matter on the substance, a track may be followed.

Observing where dust, dew, frost, etc., has been disturbed on hard substances is a great aid. If stones, pebbles, leaves, and sticks are lying about, the fact that they have been disturbed might mean that the trail led that way. Examination of suspected objects would show whether or not they have been moved. If, in dry weather, one side of an object is moist and the other dry, it indicates that the moist side has been close to the ground or in the shade. If the moist side is exposed, it is quite evident that the object has been moved.

An object remaining in one place for a long time will show a weather mark. A more or less well defined weather mark on the ground may be found which will conform to the shape of some object lying close by. Trails may be followed from one soft moist place to another. Ice on puddles may show scratches, wheel-, hoof-, heel-, and nail-marks. Places suspected of trails,

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if observed from different angles, may show tracks otherwise invisible.

Night trailing is very difficult. It may be done under favorable conditions. Tracks made in a continuous soft moist substance may be followed at night by getting down on all fours and feeling the tracks with the fingers. A much quicker way is to follow the tracks with bare feet.

In daylight, when you cannot see a foot print or any disturbance on the ground, you may pick up a trail by seeing a small clump of fresh moist mud on a dry road bed, or any article which does not belong to the surroundings and could only have gotten there by being dropped by a person, knocked from a wheel, or kicked off a hoof.

The article itself may tell you a story. Take a clump of mud for an example. Whether the mud was dry or wet will give you a clue to its age. Is the mud of the same kind of earth as the surroundings in which it was found? If not, there is some place where such mud is found. Where is it? By what route did the mud get there? What brought it there? A little common sense reasoning may let you answer these questions and you can make a continuous story from it.

Droppings of animals are an assistance in keeping on the trail on hard substances and in difficult situations.

A knowledge of the characteristics of objects,

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animals, and persons trailed is a great aid. The track of any particular person, animal, wheel, or other object generally shows one or more features peculiar to itself or peculiar to tracks made by other objects of the same class.

Such peculiarities must be looked for and noted so that the same or a part of the same track showing the peculiarity could be recognized anywhere. Tracks made by boots with hobnails on the soles are an exaggerated example of this.

Only parts of tracks will generally be seen. Even they will probably be more or less indistinct. You must be able to recognize these parts from your knowledge of the whole impression, and so, in your imagination, see the whole track before you.

EASY TRAILING.

The following are some of the easiest surfaces and conditions which reveal the presence of trails: fresh snow, fresh ice, mud, wet sand, loose earth, dust, moist surfaces, thick underbrush, tall grass, any surface recently rained upon, etc. Trails made on such surfaces are so obvious that they can be readily followed with little or no training.

AGE OF TRAILS.

Many things affect the appearance of tracks, such as wind, moisture, dust, sun, heat, snow, rain, overlying tracks, etc.

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Things to remember when judging the age of trails:

(1) On a windy day, tracks on the ground look old quickly. They are covered by dust and sand, and the moisture in them dries soon. Also, their edges will not be so sharp.

(2) If it were known when the last rain fell in a locality, and tracks show evidence of rain, it requires little reasoning to see that the tracks were made before the rain.

(3) Crossing of tracks by other tracks, the age of of which is known, aids in telling the age of the tracks crossed.

(4) Freshness or age of droppings may tell something about when a track was made if due allowance is made for the work of birds, ants, and other insects.

(5) Tracks made on growing grass can be judged as to age by the appearance of life left in the grass where it has been bruised (whether it looks dead or only bruised).

(6) The same trail which looks old on hard ground may look very fresh when seen on soft moist earth.

CHARACTERISTIC TRAILS.

Different objects, animals, and classes of people leave certain signs which are characteristic of trails made by them only.

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An observance of this in the following alphabetical list may be of use:

Objects, Animals, and People.	*Characteristics of Trails.*

AUTOMOBILES.—Automobile trails can be distinguished by the breadth and concavity of tracks made by the roundness of pneumatic tires, regular indentations of chains on tires, regular indentations of designs on the surface of tires, the absence of hoof-marks which could have any connection with the tracks made by the wheels.

Where automobiles have been stopped may be seen the impression of human feet, which were not seen before, or impressions of wrenches and tools, if the machines were repaired. All wheels hitting obstacles jump farthest when going at the highest rate of speed. (See Wheels, page 51.)

BAREFOOT TRACKS.—(See Shoes or Boots, page 49.) The track of a bare foot on which a shoe is habitually worn can be readily recognized. The imprints of the toes will show them to be in more or less cramped or contracted positions. Also, the sole of the foot will appear more narrow than the sole of a foot habitually bare. Tracks of the latter are always wide and spreading, with spaces plainly showing between the toes, and the arch

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under the instep is flat and shows plainly in a perfect track.

Frequently different tribes of savages or semi-civilized people who go barefooted habitually have distinctive peculiarities in the form of their feet. These must be studied in a country of barefooted people.

BICYCLES.—A bicycle makes two more or less wobbly tracks, one following the other. The more nearly straight one or hind track overrides the other. The slower the speed the more wobbly the tracks are liable to be. (See Automobiles for other indication of speed.) A bicycle track may disappear when the rider dismounts and picks up the machine and carries it. So, if the track disappears, look for human feet tracks which were not apparent before. Follow them. You will probably pick up the wheel tracks again or find the wheel and rider.

BREECHES.—Different regiments and different arms of an army may make use of different and particular shaped reinforcements on the breeches. If a man wearing such breeches sits on soft moist ground, the shape of the reinforcement of the breeches may be noted. If many of these impressions are seen, the presence of that particular regi-

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ment or detachment of the arm which affects such reinforcements may be ascertained.

CARABAOS. — A carabao has large, spreading, cloven hoofs. They are readily recognized and distinguished from the hoofprints of a vaca, steer, or other cloven hoofed animal. The use of carabaos indicates slow rate of travel. Also, water must be abundant in the country, as carabaos cannot go long without it.

GAITS.—For gaits of horses, see Appendix A, page 144.

GRASS TRAILS.—The direction of trails freshly made on grass will be shown by the blades of grass having been pressed down and lying in the direction in which the trails were made.

GUN CARRIAGES AND LIMBERS.—(See Wheels.)

HALTS.—Where tracks can be seen at all, indications of halts are easily distinguished. If large bodies of troops are being trailed, the foot-marks of men and animals at halts will go in all directions for short distances, crossing and recrossing. Wheel-tracks will show in places where the vehicles stopped, backed, and started again, and where the ground has been scraped by the wheels when the the brake was applied. Marks will show where the butts of rifles rested on the ground, where the staves of guidons or standards rested or were dragged for short distances, etc. In hot weather

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the ground near shade or water will show many tracks. In cold weather the ground near shelter from the wind, etc., will show many marks. Distances between halts, taken in connection with gaits, will indicate rate of travel, if hurried, etc.

HORSES.—Horses at all gaits make the deepest indentations with the toe of the hoof. The faster the gait the deeper are all indentations. The hind feet are generally longer and narrower than the fore feet. Draft horses have caulks on their shoes, whereas saddle horses do not. On slippery roads light caulks may be used on saddle horses.

At different gaits the tracks of each pair of feet appear in a different relation to each other. (See Appendix A, page 144, for plate showing tracks at different gaits.)

In order to deceive trailers, horses may be shod with the shoes reversed or put on hind part before. The deepest indentation would then be shown by the heel marks. Also, when the horse slipped the track might disclose the trick. A slight crescent-shaped mark could be detected in places between the heel prints of reversed shoes where the toe of the hoof struck the ground, if the heels of the shoes were short.

LEGGINS.—Frequently the marks of a leggin or spur-strap under the instep will tell whether the track

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was made by a civilian or a soldier. Or it might indicate a particular arm of the service or the regiment.

MORALE.—Evidences of a well-regulated march where there has been little straggling, where each arm of the service marched in its own place, where halts had not been unusually numerous, and when made they were general, when tracks leading to water had been few and those made showed evidences of having been made under proper discipline, all would go to show that the morale of the troops being trailed was good.

MULES.—Mule tracks are much the same as horse tracks, except the feet or hoofs are smaller and much longer in proportion to the width. Draft-mule's tracks will show the presence of heavy caulks, and the tracks will have a relation to the wheel tracks, if the animals are actually drawing a vehicle. Pack and saddle mule tracks will not show caulks, and the tracks will be single animal's tracks, and will not be regular as to direction. The heels of shoes on pack-mules are generally very short.

In some parts of some countries mules are not generally used, except by the army. In such places mule tracks would indicate a detachment of some kind (see Horses) with transportation.

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OPEN PLACES.—In coming to an open place, in addition to looking for evidences at your feet, sometimes the direction of a trail may be immediately picked up by looking in a general way over the ground or the vegetation covering it.

A difference of light or shade may show the trail on the ground at some distance. A slightly disturbed place in the grass or other vegetation at a distance may show the direction at once.

PONIES.—Pony tracks are much the same as horse tracks, only they are smaller. In the Philippines, Porto Rico, and Cuba a shod pony in the rural districts is an exception. Shod ponies generally belong in cities, where paved streets are traveled.

RIFLES.—Rifles rested on the ground leave some portion or all of the imprint of the stock or heel-plate. Familiarity with the kinds of small arms used by an army will lead to the distinguishing between the different rifles carried by the different regiments or different branches of the service. Unless the enemy is armed with the same rifle as your own army, the imprint of a stock will tell you whether you are trailing enemies or friends.

SABERS.—In some foreign armies officers wear their sabers habitually. Scratches on the ground where the scabbards had been dragged when unhooked, taken in connection with the tracks of a pair of

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human feet, may indicate the presence of officers. A saber scabbard when resting on the ground may make dots and more or less curved scratches on the ground.

SHOES OR BOOTS.—Human beings when walking hit the heel of the foot on the ground first, then the ball of the foot and toes. As the speed increases the heel mark becomes lighter until in a fast run there is no heel mark at all and only the marks of the ball of the foot and toes are shown. When starting to run the dirt may be scraped out behind. This may continue. The space between each foot print in walking is about one yard; when running the space is greater. Different shapes and sizes of shoes will indicate different sexes and classes of people.

SKIRTS.—Earth disturbed and swished by skirts behind and over tracks in loose soil or sand, taken in connection with tracks of small feet, indicate the presence of women. If with an army, the commander evidently does not anticipate trouble with the enemy.

STEERS, OXEN, ETC.—These are cloven-hoofed animals and are slow of gait. When an army habitually uses horses and mules as the means of transportation, if steers, oxen, etc., were used at any time, it would indicate that a larger amount of supplies

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than usual were being transported at a leisurely gait. Or it might indicate that the means of transportation of the enemy had suffered from some disaster, scourge, etc.

SPEED OF MARCHES.—Length between halts, taken in connection with indications of gaits of men and animals, indicate the haste or lack of it by the troops on a march. Several parallel roads used by troops while marching indicate a concentrated march. Many articles abandoned along the way indicate haste.

SPURS.—Mounted soldiers, when dismounted, may leave indications of their presence which will distinguish them from infantrymen or dismounted men by a slight indentation being seen behind the heel where the spur struck the ground in walking. The mark of the spur strap may also be noticed under the impression of the instep.

TROUSERS.—On loose ground or sand, irregular crescent-shaped indentations behind the heels of a man's shoes would indicate that long trousers were worn. A regular shape, if a spur is not shown, might indicate that a long, loose, stiff leggin was worn.

TRAVOIS. — Two long, parallel, continuous tracks, scraped in the ground, if taken in connection with the tracks of a mule, horse, or other animal, might

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indicate a travois. The use of travois by an army usually supplied with wheeled ambulances would indicate that an unusually large number of sick and wounded were being transported.

WAGONS.—(See Wheels.)

WHEELS.—Familiarity with the kinds of wheeled transportation tracked, taken in consideration with the width of tires, width between the wheels, and kind of animals used to pull the vehicles, will facilitate distinguishing the kind of wheeled vehicle trailed.

The direction in which wheels have gone can be told by the direction the animals' feet have traveled; also, the direction may sometimes be noted by observing the scratches on the sides of deep ruts, especially if made in clayey mud or soft mud. Halts can be distinguished where it was seen that the brake was applied where the ground is scraped and mud has dropped from the wheels. Wheels resting for some time in soft ground sink in to some extent. Animals halted in harness make an unusual number of hoof-marks in the same place. Tracks of human shoes not seen previously, and disappearing again, may be seen near halting places. When the brake is taken off, preparatory to moving, the wheels may slip or roll back slightly when ascending a grade from a halt.

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When wheel tracks jump over a small obstacle, such as a stone, they approach to the obstacle close on the side from which they come. They then go over and hit the ground farther away from the obstacle. The bare space is the greatest on the side toward which the track is being laid. If the vehicle is stopped, backed, and goes on, the direction can be easily seen where the tracks cross over their first impression when they proceed.

LAYING A TRAIL.

In order to direct a command over a route, it is sometimes necessary that a scout leave an unmistakable trail. In addition to the usual indications unconsciously left by persons and animals traveling over the country, it is well, on such occasions, to resort to some more artificial and unmistakable method of leaving signs.

If the signs left by the scout are understood by one man, traveling at the head of the column, the trail may be followed unerringly and unhesitatingly.

Even in peace, when on practice marches and maneuvers, two or three scouts, acting as pathfinders, may precede a command marching through a strange country which is poorly mapped. The pathfinders, starting fifteen or twenty minutes before the command,

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find the proper direction. They leave signs indicating the proper route at all places where there might be the slightest uncertainity in the minds of those following.

The command following proceeds without loss of time and with the satisfaction of knowing that steps taken do not have to be retraced. The pathfinders may also be called upon to do trailing and so lead a command to an enemy or to join other troops of their own army.

The scouts detailed to act as pathfinders must be able to find their way with absolute certainty through the country on roads and across country independent of roads.

The pathfinders are assisted in doing this by the following:

(1) A knowledge of the points of the compass.

(2) A knowledge of the general direction of places sought.

(3) A knowledge of the location of places sought in relation to other places and features of the landscape.

(4) Asking questions of people in the country.

(5) The use of maps of the country traveled.

(6) Ability to trail.

The signs must not attract undue attention and must be made from or on materials at hand. No one

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set or kind of articles can be used, as the article it was decided to use might not be available when needed. The signs must then consist in the significance of the arrangement of any articles or marks. Also, the signs must be left in places previously agreed upon.

Any articles or marks which can be placed in certain positions relative to each other, previously agreed upon, may be utilized for signs. The significance of the signs would be shown by an arrangement of the following:

(1) Any small movable articles found in the vicinity of the place where it was desired to leave the sign, such as stones, sticks, etc.

(2) Hatchet marks or blazes on trees or posts.

(3) Knots tied in long grass or standing grain.

(4) Scratches or marks on anything, such as on the ground, boards or posts of fences, telegraph-poles, rocks, etc.

(5) Impressions of the pathfinder's foot or impressions of anything made on a soft substance which will receive it, such as soft moist ground, mud, snow, wet sand, etc.

It is probable that no one of the methods could be used throughout while laying any one trail. For example: One sign might be an arrangement of stones on the ground. When it was necessary to make this sign again, no stones might be at hand. The sign

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would then be made by the same arrangement of scratches on the ground or on a rock. The next time the sign was made it might be the same arrangement of hatchet-marks on a tree. A resort to the use of several of the methods while laying the same trail would be an advantage, as it would elude the curiosity of persons whose attention had been accidentally attracted by one of the signs.

The signs indicating the direction of trails laid should be placed as follows:

(1) *At Cross-Roads.*—From five to ten paces from the intersection of the roads in the proper direction, whether the direction of the trail has changed or not.

(2) *At Forks in the Road.*—Where the trail leaves a well-defined road or path which the pathfinder has been traveling, a sign should be placed on the old road indicating the new direction at the place the trail leaves the road.

Another sign is then placed five to ten paces from the old road on the trail in the new direction.

(3) *Across Country.*—It would be understood that the direction of a trail would not change unless marked by a sign (except on well-defined roads or paths). However, when going across country, it would be well to leave signs at frequent intervals. Signs should also be left when entering

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and when leaving a forest, jungle, ford, or high standing crops, and they should be placed on the tops of divides and hills.

When traveling on well defined roads or paths, signs are ordinarily left only at the first two places mentioned, unless the distances between signs become excessive. In such event, simply to reassure those following the trail, signs are left at regular intervals, previously agreed upon. For example: At intervals not greater than a mile. Across country they should be so frequent that there would be no possibility of missing them.

When laying a trail on a road, the signs should be placed off the road, a short distance, where they will not be disturbed by traffic. They should be placed preferably off the right side of the road, path, or trail. If this can not be done, then place them in the same relative position on the left side. On unfrequented paths, in thinly settled districts, the signs might occasionally be placed in the middle of the road, if there is little danger of their being disturbed. Care must be exercised by the pathfinder that his actions while making the signs are not observed by any curious person who might destroy them after he left.

A command preceded by pathfinders should always have in the lead at least one man who understands the signs.

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The following arrangement of articles or marks composing the signs and their significance is suggested:

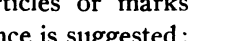
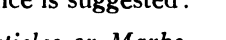
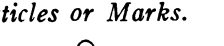
Significance.	*Arrangement of Articles or Marks.*
(1) Indicating the direction of a trail:	
(2) Indicating that the trail leaves the road here and the direction it takes:	
(3) Indicating that a message has been left in the vicinity and indicating the direction of its locality:	

Fig. 5.

Note.—The one article, scratch, or mark of a sign which stands separate from its companions is the *"Indicator."* It indicates the direction. For purposes of illustration, it is shaded in the diagram. The arrows, also, are for illustration only, and need not be marked or scratched on the ground or other surface on which the sign is made.

Below are some examples of the above signs. Any materials available may be used in making any of the signs. (See Fig. 6.)

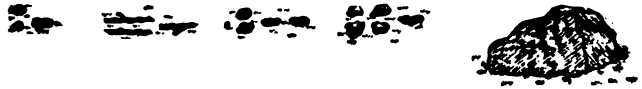


Fig. 6.

Signs that a message had been left may be placed at any point where they would be seen. They would preferably be placed close to signs indicating the direction of the trail. Messages themselves could be

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left at various kinds of places. For example: Underneath a stone, clod of earth, or rock in a field, or in the hole between a loose fence-post or telegraph-pole and the earth.

The direction of the place and object secreting the message would be shown by the indicator of the sign showing that a message had been left in the vicinity. The object secreting the message would be designated by being encircled by a ring of stones, sticks, or other articles, by having a circle scratched in the ground around it, by a stone being placed on such objects as a low post, or by a cross being scratched on such objects as large rocks, tall posts, or telegraph-poles.

Below are some examples of objects which may be used in secreting messages. (See Fig. 7.)

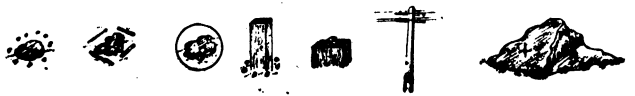

Fig. 7.

As a very short time would elapse between the time when a message was left and when it was reached by the head of the column following the pathfinder, the chances are in favor of its not being disturbed, provided the pathfinder was careful to avoid observation while secreting the message.

If considerable time would elapse before a message would be found, resort should be had to more

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permanent signs than ground signs. Scratches could be made on large rocks or blazes on trees, indicating that a message had been left. A trail can then be laid away from the traveled route to a secluded spot where an object might be found which would protect the message from the weather, if need be, and where it would be less liable to be disturbed., The man leaving the message would then come back to the traveled trail and proceed on his way.

Pathfinders must keep far enough ahead of their columns to allow them time to leave signs and make any investigations and inquiries necessary. They must look back frequently toward the direction of the column and they should constantly have some idea of its location. This may be done by observing clouds of rising dust, disturbed by the column, observing the distant movements of the column from an elevation, etc.

If they are convinced that the column has permanently halted, or for any reason the column is not following the trail laid by them, the matter should be investigated at once.

The system of signs mentioned above is one which has been tried out by the scouts of a regiment of cavalry in the United States. The details of the system are mentioned here only by way of suggestion. Different organizations may evolve their own systems and thus insure secrecy.

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CHAPTER IV.

COVER AND OBSERVATION.

From the moment a scout leaves his command, he should become as invisible as though he did not exist. And he should remain so, to friends and foes alike, until such time as he chooses to make his presence known or until he has returned to the freedom and safety of his command.

When scouting, just because you do not see anything, do not be so sure that you are not seen. Men who have scouted during our own Indian wars will tell you that that was just the time they had to be most cautious.

Every moment after leaving your command must be made with as much caution and care for concealment as though you were momentarily in danger of being fired upon. As a matter of fact, you may be. Your camp or command may be under observation all the time; if so, the moment you leave it, you are seen and followed under cover.

Do not be ashamed to take every precaution known to you and to make use of every trick you know to keep from being observed and to fool a person watch-

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ing you, although you can not see a soul or do not even know someone is observing you. Soldiers and even some scouts, through fear of ridicule or through bravado, deliberately fail to use the precautions with which they are familiar. One moment of carelessness may end your history right there, and worse still, your mission will then not be carried out.

The following reasons should be sufficient to show why your presence should be kept a secret from the enemy:

(1) The enemy can be observed to a better advantage when he does not know he is watched.

(2) The enemy's knowledge of your presence might give him a clue to the proximity, direction, or movements of your army which he did not have until he saw you.

(3) In order to save your own skin, and so allow you to accomplish your mission.

EFFECTS AND USES OF CERTAIN EXPEDIENTS.

Noiselessness, remaining motionless, and blending yourself and your horse with your surroundings are some of the greatest aids in avoiding detection.

CRAWLING.—Crawling may be resorted to in many instances where your presence might be detected if you moved about on your feet. It is useful near sky-lines and in low underbrush. Keep your head up as high as your back when on all fours, or you

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may inadvertently get your back up where it can be seen. If your head is up, you can see better and you will know how high is the highest part of your body.

COLORS.—Certain colors blend well with others and do not make a sharp contrast which attracts attention. Remember the color of your uniform and the color of your horse and their relation to surrounding colors.

DOGS.—In approaching any inhabited places, be careful that dogs do not disclose your presence.

FOLDS IN THE GROUND.—You should take advantage of every inequality and fold of the ground. Even a fold only seven feet high, with a slope so gradual that it looks almost flat, is of use to a dismounted man. Keep on low ground. Go to the high places for observation. While on the high places look for and see that low ground is clear of the enemy, then travel it to the next high place for a new observation.

GROUND CONDITIONS AND NOISE.—The noise of your horse's hoofbeats and our own footfalls must be avoided if possible. Noisy ground, such as the surface of a hard-packed or macadam road, should be avoided. Avoid all pebbles or rocks. One clink of a horse's shoe on a pebble may give everything away. Loose dry leaves, sticks, and

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underbrush, especially if dry, are to be avoided as a pest. A horse splashing through still water can be heard a long way off, especially at night.

Sand and soft moist ground and turf with green grass on it serve to deaden the sound of your horse's footfalls or your own steps, but remember you leave a track on such surfaces. Ground covered thickly with pine needles is almost soundless for both man and horse tracks, and it takes a practiced eye to pick up a track on such a surface.

HAT.—The changing line of shade which your hat-brim makes on your face as you move around attracts attention. If you are still, it may not be seen.

HEARING.—If you think you hear something or wish to hear better, cup your hand to your ear as deaf people do. It will catch more of the sound.

HOOFBEATS.—A barefooted horse makes less noise than one with shoes on. You may deaden the sound of hoofs by wrapping pieces of grain sacks and tying them just below the fetlock joint. This may be resorted to for a short distance and when traveling close to the enemy at night.

HORSE.—Your horse is a large animal and is hard to hide. If you dismount and go a short distance

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to observe, leave your horse in a hollow, in the shade, tied securely and with some grass to nibble or something which will keep him quiet. Have nothing on him which glitters. However, never become separated from your horse unless he is held or guarded by a friend.

MOVEMENTS.—A gradual movement, inch by inch, is less likely to observed than a sudden jerk. (See Movements, page 72.)

OBSERVATION POINTS.—Observation points must be approached under cover. You should have more than one way of getting out of them. Always come away by a route other than the one you used in entering, also under cover. If there is no cover on the observation point, use some expedient, such as a bush held in front of you; grass in your hat band or tied on your head; lying close to the ground with only the eyes and head above the eyes showing; take off your hat before going up. shade the eyes and cover the white of your forehead with your arm. Crawl up. If observing from a window of a building, make use of a curtain or half-closed shutters to peep through. Look through holes and broken places in hedges, fences, walls, etc. Always try to get an observa-

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tion-point on an elevation so that the position, road, country, etc., observed present a "bird's-eye view."

ROUTES.—Always use another route for returning. The enemy may see you on a road and wait for you to return on it and ambush you.

SEEING.—When observing at long distances, partially close your hands and look through them as though you were using field glasses. It concentrates your gaze and cuts off confusing and unnecessary light.

SHADOWS.—Observe all shadows closely. Shadows are long when the sun is low in the sky. A shadow in some lights may be seen when it is difficult to see the object making it. Get in a shadow when observing. If you do not, you make one yourself, if the sun is bright and hangs low.

SOUND.—Your ear to a metal track will tell you of the approach of cars or any movement on the track; also, your ear to the ground or to a stick driven in the ground may aid you in hearing distant hoofbeats, footfalls, and the steady tramp of horses. A telegraph pole will not do, as the wind on the wires makes a louder sound than the vibrations from the ground.

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Sounds in the air carry farther in cold weather than in hot weather. In hot weather the air is less uniform in density and more liable to accidental currents which interfere with the passage of sound. Night air is more uniform in density than air in the day-time. Therefore sound travels better at night.

TREES.—Trees are a good place for observation, but they are bad places in which to get caught. If you wish to avoid detection when up in a tree, hug close and flat against the trunk or lie close to a large limb among the branches and keep still.

By keeping close to the trunk of a large tree and moving around it so as to keep the tree trunk between yourself and those from whom you are seeking cover, you may avoid detection from small parties of men who keep close together.

TRACKS.—In moving around, remember you make tracks yourself. To avoid making them, move on hard surface as much as possible and disturb nothing on the ground, not even the foliage of bushes, etc. If you wish to fool the enemy, when you come to a soft place in the ground, go around it on hard ground. Walk back over it, making a track in the direction opposite to the one you are traveling. Then go on about your business over hard ground.

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UNIFORM.—The olive drab or khaki service uniform is extremely hard to see against any background, if you keep still and do not make a shadow.

WIND.—Wind carries sound and odors. So do not go between the wind and the enemy. Let the wind blow from the enemy to you. The slightest zephyr which you can not detect on your face may be enough to carry sound. To see which way the wind is blowing, moisten the finger and hold it in the wind. The side which becomes cool is the side from which the wind is coming.

WRIGGLING.—Astonishing speed may be attained by practice in wriggling along the ground. It is extremely useful at times.

I will mention a few *"don'ts"* to bear in mind if you are seeking to avoid detection:

"DONTS."

Don't cross an open place if you can go around it.

Don't wear anything of a violent or pronounced color.

Don't ride a white or gray horse (except when your background is white). A dark buckskin or a light bay horse is safest.

Don't have any article about your person or about your horse that has a shiny or polished surface. It may catch a ray of sunlight and flash it to the enemy.

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Don't let anything about your horse or your person tinkle, jingle, squeak, or rattle.

Don't make any noise except footfalls, and make them as soft and light as possible.

Don't show yourself against a sky-line either night or day.

Don't look over the top of cover, such as a rock. Peer around it.

Don't stand with dark clothes on against a light wall or anything light in color, or *vice versa*.

Don't forget the color of your horse as to whether it will blend well with your surroundings

Don't make any sudden movement when in immediate danger of being observed.

Don't be noisy.

Don't let your horse be noisy.

Don't light a fire that smokes unless you want to use it for a signal.

Don't *smoke* and don't let anyone with you smoke.

Don't go into a place from which you can not see out, unless you leave on the outside someone to watch and to signal approaching danger.

Don't think you are not observed because you see nothing.

Don't fail to take every precaution you know.

Don't be careless even once; if you are, it may be the last time.

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I will mention the conduct you should observe, in order to prevent being seen, in a few of the places you may have to travel or from which you may have to make observations:

AIRSHIPS.—If operating against an enemy who uses airships or aeroplanes, the sky must be constantly watched. Cover must be obtained from above by getting into forests, lying under shrubbery, remaining motionless in shadows, etc. Not so much personal danger as at first might appear should be expected directly from aerial observation. But it might be important to keep the knowledge of your presence secret. You could not be carried off in an aeroplane or airship (a dirigible or ordinary balloon cannot easily drop down and rise at will). It would not be likely that a bomb would be wasted on one lone man, but a rifle can be used by a passenger either from an aeroplane or an airship.

BRIDGES.—The footfalls of a fast-moving horse on a wooden bridge make a noise like a bass drum. Go over a wooden bridge at a quiet walk. Examine the bridge before going over it. It may have been tampered with and fixed as a trap to let you through. Look under it before going over it. If you do, you may not want to go over it.

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If you do not, you may not be able to get back over it. See if the bridge is watched before venturing on it. Pick out, before leaving the near side, the cover you intend to use as soon as you have crossed.

BUILDINGS AND INCLOSURES.—Never enter a building, yard, corral, or other inclosure without leaving a man outside on watch to give the alarm if danger approaches. Make sure there is some way out other than the one by which you entered. Learn how to get out the other way before you enter, if possible. If not, find out as soon as you get inside.

Do not stay hidden any length of time in a place where you can not see what is going on around it, unless you leave a man on watch outside in a place where he can see and from which he can warn you.

DEFILE OR RAVINE.—Do not go through it if you can avoid it. Go around it if possible and look into it from a flank height on the way. If you must go through it, observe it from cover for a moment. Look as far through it as you can see. Then dash through it and examine the other side, the moment you are through.

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FOREST.—Move cautiously, looking as far into the forest in all directions as you can see. Always look up into the trees before passing under them. Look back frequently. Stop frequently. Look. Listen. Keep your nose sniffing constantly to detect fresh horse-droppings, fires, or any other odor that is foreign to your surroundings. Watch the ground for any tracks going either way or crossing. Stop and observe what is around the corner of a sharp bend of the road which you can not see around until you come to it.

When you are nearly through the forest, stop under cover and lie still. Observe very carefully every bit of open ground before you, and assure yourself there is no undesired presence there or person observing it before dashing across to the next cover.

HILLS.—In ascending an elevation, mounted, as you near the top, slow up, peer over and see that all is clear on the other side. If you wish to use it for a more extended observation, withdraw gradually until you are below the sky-line. Go quickly to a place where you can secure your horse. (See Horse, page 63.) Approach the sky-line on foot. Crawl or wriggle when you are near the top. (See Observation Points, page 64.) If you must

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cross the hill, find cover which will get you over the sky-line without your being seen.

LOCATIONS.—Remember the locations of places which you have passed to which you may wish to return. Entrances to jungles, bridges, fords, etc., may have to be made for in a hurry. After leaving such a place, look back, and fix in your mind its location in relation to some prominent point or points.

MOVEMENTS.—While observing, keep still, be absolutely immobile. The enemy may take you for a part of the landscape.

NIGHT.—Familiarity with a country to be traveled successfully at night is almost a necessity. If near the enemy, go across country, avoid bridges, fords, woods, and cross-roads which may be watched. An enemy watches usual lines of approach more carefully at night than he does other places. Outposts are frequently placed at night where the sky-line can be watched. Wriggle over a sky-line, if you suspect an enemy, even if the stars are the only light.

NIGHT OBSERVING.—When observing at night, for suspected movements in your vicinity, get down low to the ground. Familiarize yourself with the stars that are low down and seem to rest right

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on the ground you are watching. Take the lowest stars, that do not twinkle. If someone steps between you and those stars, they will appear to go out. When the person passes they will reappear. If one or two of them which are close together seem to go out and reappear again and remain in sight, someone is probably coming toward you. If they disappear and reappear successively from right to left or *vice versa*, someone is moving across your front. If this continues, then it is a column.

OPEN PLACES.—Do not go across an open place if you can avoid it. Observe the open place from cover, from several points. See that it is clear of any undesired presence and is not being observed. Look for a hedge, wall, sunken road, line of trees for continuous shade, or even a strip of ground the color of which will not sharply contrast with you and your horse. If you can find any of the above kinds of cover running in such a way which will aid your concealment, use them. You may find a little of several of them. Go quickly from cover to cover, however slight, until you are across the dangerous zone.

Dense clouds floating in a clear sky may be taken advantage of at times. Watch for one to come between you and the sun. If from the di-

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rection the wind is blowing it is seen that the cloud is going your way, you may travel in its shade.

SNOW.—Unless you are wearing clothing all parts of which are absolutely white and your horse and his equipment are white, it is almost impossible to avoid detection, day or night, if your background is clean snow in clear weather.

VILLAGES OR TOWNS.—If the village or town is at all under suspicion, do not enter it if you can avoid it. If you must, conduct yourself much as you would in a forest. (See Forest, page 71.) In addition, look at all doors and windows. Look up and back at all windows, porches, and roofs. You should look as much back as you do forward. When crossing streets, peer around the corners before showing yourself. Then dash across as you would an open place in the country.

OBSERVING AND BEING OBSERVED BY THE ENEMY.

You may follow the enemy by day and watch his preparations for the night, noting all dispositions of troops and the location of the outposts. See if the outposts are changed as darkness comes on. You may then slip through between the outposts and gain more detailed information. Or you may get close enough to hear the conversation of the men composing it and may learn something.

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While scouting you may suspect the presence of an enemy although you can see no signs of him. Appear as though you saw him and attempt to get away, looking back all the while. He may rise and show himself to fire at you. If you go fast in a zig-zag direction, the chances are that he will not hit you. If he does not show himself, change your route or approach him from another direction. He may have to change his position to watch you and in so doing may show himself.

If you think you have passed an enemy and he is observing you, go on a bit, then turn suddenly. He may have become careless and shown himself while your back was turned and you may catch him.

If, having observed a piece of ground or landscape, you feel that something has disappeared from it since you first saw it, you were probably watched and may still be under observation.

If you find that you are being observed by only a small detachment and they show no signs of immediately molesting you, appear as though you did not see them. Gradually withdraw to cover. Move under cover to another point and observe them.

Or, if they appear to be starting after you, pretend that you have other men with you whom they cannot see. Beckon or make signs as though to your friends. The enemy may think it is healthier to re-

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main where they are or they may get away themselves rather than molest a party they cannot see and of whom they know nothing.

Always keep the enemy guessing. Never let him know what you are going to do from one moment to another.

CAPTURED.

If you are captured, it will probably be from overlooking some point which you should have observed. Generally, you will have only yourself to blame.

If captured by a civilized enemy, remember that the "Laws of War" do not allow a prisoner of war to be maltreated in order to get information from him. Chew up and swallow any important papers you may have or in some way prevent them from falling into the hands of the enemy.

If you were in uniform, you cannot be shot as a spy. Remember that the tendency now of all civilized nations is to treat prisoners of war humanely. Your own conduct may have a great deal to do with the way you are treated. Sit tight. Don't lose your head and you may get away. Even though you are not able to effect your escape, you may be able to get in communication with your army and give information which could not have been obtained in any other way. The value of your work then may be beyond estimate.

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CHAPTER V.

OBSERVATION AND COMPREHENSION OF MILITARY FEATURES.

It is necessary that a scout should be able to see and comprehend at a glance all the principal features coming under his observation. Some men have a natural aptitude for this, while others must cultivate it. When passing a building glance at it for a second, then turn the head away, and from the mental picture you retain count the number of windows, doors, etc. Look back and verify your count. Glance in a store window as you walk past it. After you have passed, tell yourself all the things you saw in the window. Then go back and ascertain how many things you failed to observe.

On returning to report verbally, you may be asked questions regarding some feature which you did not particularly note during your observation. If you have a mental picture of everything your eye saw, you will be able to answer intelligently.

In addition to being able to take in and retain everything, it is necessary that a scout should be able

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to appreciate features from the standpoint of their military importance. If you will familiarize yourself with the military features of subjects given below, and while observing look out for these features particularly, you will increase your powers of perception and your value as a scout as well.

The subjects are alphabetically arranged and can be readily referred to before going on a reconnaissance which will include any of them.

Before arriving at the place of observation, fix in your mind all the military features you may have to report on and look for them.

Subjects. *Military Features.*

AMBUSHES.—The following are some of the requisites of a position for ambush: The position should be on the road or line of advance taken by the party to be ambushed. The position should allow of observation for great distances in all directions; it should have a free field of fire at effective and close ranges; cover from observation and rifle fire should be afforded by natural features; it should be difficult to flank; there should be a "get away" under cover for the ambushers.

The ambushers should never be seen by the ambushed. The ambushers should be able to withdraw at any time. Protection afforded the

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position by an impassable obstacle is an immense advantage.

Report on the following: Location, nature of cover for ambushers and ambushed (whether bushes, a wall, rocks, etc.), vegetation and trees surrounding ground and comanding position within effective ranges; roads or other means of passing around under cover, lines of advance and retreat for both sides. Draw sketch.

BIVOUAC.—Location, extent of ground, water supply, how sheltered or concealed, shelter from the elements available, defensibility, accessibility, surrounding ground.

BRIDGES.—Location, name of the stream or river crossed, length, width, height above the water, kind of bridge (whether truss, trestle, suspension, etc.), material, repair, material close by available for repair. Can the stream be forded close by? How can the bridge be demolished?

BRUSH.—Nature of growth, extent, height, thickness, means of passing through or around it. Can you get through it mounted—on foot? How far can you see into it?

BUILDINGS.—Location, present use, material of which made, dimensions, number of floors, kind, number, dimensions, and situations of windows, doors,

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and skylights; number of rooms; number and kind of chimneys; heating system; material and style of roof; telephone or telegraph connections; electric light wires; suitability for defense; water supply; porches; general shape or ground plan; outhouses; approaches; surrounding ground. How could it be demolished? If a residence, what is the name of the head of the house? (Look on the mail-box or door-plate.)

CAMP SITES.—*Observation and Selection of New:* "The selection of camp sites is governed by the following conditions: (F S. R.)

1. The ground should accommodate the command without crowding, be easily drained, and have no stagnant water within 300 yards.

2. The water supply should be abundant, pure, and easily accessible.

3. There should be good roads to the camp and good interior communication. On account of dust and noise it is not desirable to place a camp on or near a main road.

4. Wood, grass, forage, and supplies must be at hand or easily obtainable.

Closely cropped turf with sandy or gravelly subsoil is best; high banks of rivers are generally suitable, provided no marshes are near.

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In hot summer months the ground should be high, free from underbrush, and moderately shaded with trees if possible.

In cold weather ground sloping to the south, with woods to break the north winds, is desirable.

Old camp-grounds and the vicinity of cemeteries are undesirable. Marshy grounds and stagnant water are objectionable on account of the damp atmosphere and the annoyance and infection from mosquitoes. Ground near the foot of a hill range generally has a damp subsoil and remains muddy for a long time. Thick forests, dense vegetation, made ground, alluvial soil, punch-bowl depression, inclosed ravines, and dry beds of streams are unfavorable.

Camp sites should be selected so that troops of one unit need not pass through the camp-grounds of another."

If it is necessary to camp near old camp sites, go as far as possible to the windward. The site should be easily defended if in the vicinity of the enemy. (See Camps, Appendix A, page 137. See Water, page 94.)

Observation of Old: When last occupied; last occupied by friends or enemies; what part of the army (what corps, regiment, etc., look for

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marking on discarded articles of uniform, equipment, etc.), number of each arm, number of animals, amount of transportation, amount of supplies thrown away would indicate stock of food supplies. Amount and seriousness of soil and water pollution (if serious, would indicate a lack of discipline and a poor morale). Kind of shelter used; length of time occupied; any new graves. Why was the camp abundoned? What direction did the former occupants take when they left?

Observation of Those Occupied by the Enemy:

(See Camps, page 15; see Fire, page 18.)

CITIES.—See Towns.

CANAL.—Name; route; principal places it connects; draught of vessels it will accommodate; width; height and condition of tow-path; mechanism, repair and capacity of locks; how possible to disable or destroy; number and kind of boats. Is it in use? If not, why?

COUNTRY.—Whether rolling, mountainous, or flat; thickly or sparsely inhabited; roads; railroads; electric lines; telephone and telegraph lines; kind and condition of crops; vegetation; trees; number and kind of cattle, horses, and game; watercourses (streams, rivers, etc.); prominent or peculiar features by which localities could be rec-

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ognized by a stranger; directions which you could give a stranger by which he could find his way to any part of the country or locality described; food, fuel, forage, grazing, water, and military supplies obtainable. Is the country healthy? Find out from the inhabitants if there has been sickness of any one kind lately. If so, what?

DEFILE.—Length, width, height, angle of slope and nature of sides, ground which commands it, ground which it commands, cover for defenders, cover for attackers, lines of retreat for defenders, lines of advance for attackers.

DEPOTS, R. R.—Name, where located; wagon roads; electric lines and waterways reaching it; railroad system to which it belongs; facilities for loading, especially for loading animals; wires of telephone or telegraph lines entering the building. (See Railroads.)

DIRECTIONS.—The points of the compass are used in connection with locations which are known, when directions of other locations are described.

Example: The camp is on the west side of the road. Never use the expression, "To the right," or "To the left." (See 6, page 122.)

DISTANCES.—(See Measures, Appendix A, page 145.)

ELECTRIC LINE.—Name of operating company; name

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of the line; location of stations, car barns, offices, and power plant; route, principal places connected; number of tracks; manner of transmission of power; kind of cars (freight and passenger), and their estimated capacity.

ENEMY.—Familiarity with the language of the enemy is very valuable. Learn to know all the uniforms of the enemy. Ascertain how different regiments and different branches of the enemy's army are armed. Study all peculiarities of habits, methods of action, etc. (See Troops Moving and Troops Stationary, page 93.) *"When it is certain that the enemy has been discovered, that fact is promptly reported."* (F. S. R.)

FARMS AND RANCHES.—Location; name of estate; name of owner or occupant (look on mail-box); amount of ground occupied; nature of ground, whether rolling or flat; covered with trees, grass, crops, orchards, or vineyards; nature and amount of water supply; facilities for watering animals; what is raised, cattle or crops; number and kind of stock, fowls, etc.; number of persons employed; number, location, and uses of buildings; telephone communications (see Telegraph and Telephone Lines); kinds of fences; general appearance in regard to repair of fixtures and prosperity of owner or occupant; number and kind of farm-

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ing implements. Could a command camp there? What kind and how much military supplies does the place afford?

FERRIES.—Power used; working order or not; number and capacity of boats or rafts; distance across; approaches; facilities for loading; how it may be destroyed. Are there one or more fords close by? Look for them, no matter what the inhabitants of the country may say.

FORDS.—Depth; kind of bottom; distance across; direction, whether straight or zig-zag; approaches; surrounding ground; nearest material for destroying; nearest material for marking or making it more practicable.

A sketch of a ford is a great aid to other persons in finding and using it. On the sketch, indicate the direction of the ford all the way across the stream by dotted lines.

Old fords will be shown by paths or roads leading down one bank into the stream and out on the other bank. If there are any sand-bars, little islands, or rocks in the stream, look on them for indications of trails.

New fords should be looked for in the broadest, straightest part of the stream. The water is more shallow there. At banks the water is deepest at the concave bank. In winding streams,

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fords may be found by going diagonally across the stream, in order to escape concave banks. Boats in the swiftest part of the stream may be used to find new fords. Throw a rope overboard with a weight attached. Let the length of the rope in the water equal the desired depth of the ford. This or a less depth will be noted when the weight hits or drags on the bottom.

"Additional fords should be sought despite the denial of their existence by the inhabitants." (F. S. R.) (See Fords, Appendix A, page 140.)

FOREST.—(See Woods.)

FORTS.—Location, shape, or trace of work; material; height and extent of parapet; depth and width of ditch; nature, position, and range of obstacles from works; means available for destroying or rendering obstacles non-effective; number and caliber of artillery pieces; water and food supply; strength and morale of garrison.

Use every endeavor to make a sketch of a fort to be reported upon. The trace of the work, with lines of approach and commanding positions, may at least be shown roughly. A base line may be established on a distant elevation and a rough sketch made by intersection. A rough sketch from memory is better than none at all. Mark such a sketch "Drawn from Memory."

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GARAGES.—Location; number and repair of automobiles; amount of gasoline and lubricating and illuminating oil on hand; materials and facilities for repair of automobiles or other machinery. Good road maps of the surrounding country and valuable information regarding roads in the vicinity may frequently be obtained at garages.

GORGES.—Location; depth; width; accessibility; slope and nature of sides. Is it the bed of a watercourse? If so, how can it be crossed?

HILLS.—Location; extent; whether single or in chains; degree of practicability of slopes (See Slopes, Appendix A, page 148); nature of sides, whether grassy, wooded, rocky, or cultivated; extent and direction of view. Where is the military crest? (See Military Crest, Appendix A, page 147.)

INHABITANTS.—Nationality; language; principal occupations; manner of living, in towns or country; friendly or hostile; average intelligence and reliability in regard to giving information.

JUNGLES.—(See Brush.)

LAKES.—Location; extent; depth; banks; surrounding ground; source of water supply; if fresh, purity of water and accessibility for watering animals; boats; piers or other landing places; if navigable.

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LOCATIONS.—Geographical position in and name of state, province, or county; distance from, direction from, and names of nearest roads, railroads, telegraph and telephone lines, water-courses, valleys, mountains, sea coast, city or settlement, post-office, railroad station, and boat landing.

Features having different sides should be reported upon in regard to the relation of the sides to the points of the compass (that is, whether facing north, east, south, or west). (See Directions, page 83.)

LOOKOUT PLACES.—They are generally elevations; nature (whether towers, hills, trees, etc.); height, extent, and direction of view; location; number and location of means of approach and more than one return under cover.

MARSH.—Location; extent; shape; depth; vegetation; nature (whether simply boggy or deep water and vegetation); where passable; if impassable, practicability of making passable; ways around.

MOUNTAINS.—Location; a single mountain or chain of mountains; if chains, the direction they run; sky-line (saw-toothed or straight); highest and lowest points; roads crossing. (See Hills.)

OBSERVATION POINTS.—(See Lookout Places.)

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POSITIONS FOR ATTACK.—Lines of approach; commanding positions and their ranges; nature, position, and extent of obstacles; nature and position of cover and lines of retreat.

A sketch of the enemy's position and the surrounding ground within range of the longest arm which would be used by either side in an attack is of untold value. (See paragraph which treats of sketch under Forts, page 86.)

POSITIONS FOR DEFENSE.—"A defensive position should possess as many of the following features as possible: (F. S. R.)

1. A good view of the front and flanks, and within the position itself.

2. A good field of fire to the front and flanks.

3. Ground suited to the size of the command, with good communications laterally and to the rear, and with an ample supply of good water.

4. Shelter from the enemy's fire and concealment from view.

5. Ground in front that will impede the assailants without furnishing them cover.

6. Flanks easily protected.

7. Ground favorable for making local counter-attacks and offensive returns, and for assuming the offensive.

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8. A location that will compel the enemy to attack the position or abandon his advance.

9. A line of retreat running straight to the rear from the center of the position. If a flank position parallel to the enemy's line of advance is assumed, the flank nearest the enemy should rest on an impassable obstacle, and the line of retreat should be perpendicular to the front for some distance in rear of the position."

RAVINES.—(See Defiles.)

RAILROADS.—Name; point at which road was observed; in operation or not; number of tracks; sleepers; gauge; ballast; position of curves; cuts and fills; location; number and kinds of switches and sidings with lengths of sidings; number, kind, and capacity of engines and cars; locations of offices, storehouses, blacksmith and machine shops; general direction of the main line and branches; location of junction points with branches and other lines; principal places reached by main lines and branches; number of telegraph or telephone lines along the route. (See Telegraph and Telephone Lines, page 92. See Depots, R. R., page 83.) *Get a folder and time-table.*

RAILROAD DEPOTS.—(See Depots, R. R.)

RANGES FOR FIRE.—(See Ranges, Appendix A, page 147.)

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RIVERS.—Name or names (it may have a different name in another locality); whether or not navigable; depth; width; height of banks; fords; ferries; bridges; boats; whether or not affected by tides if near the coast; if frozen, condition and thickness of ice. Speak of the right or left bank of a river as the banks are on your right or left as you face down stream. (For velocity of currents, see Currents, Appendix A, page 138.)

ROADS.—Name; location of part observed; direction; length; principal places it reaches; width; material of road-bed; present condition; probable condition in bad weather; principal cross-roads, their direction and principal places to which they lead; fences; maximum grades; bridges; parallel roads; nature of the country through which the road passes. (See Roads, Appendix A, page 148.)

Note.—"A road is designated by connecting two or more names of places on the road with dashes, thus: Leavenworth—Lowemont—Atchison Road." (F. S. R.)

SHIPS.—Name; nautical name for the place to which the ship belongs, nationality of flag flying; length; breadth; number of masts or number of masts and funnels; locomotive power; speed of which capable; draught; tonnage; amount and kind of passengers carried when observed; number and nationality of crew; color and distinctive features

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by which the ship could easily be described and recognized.

SLOPES.—(See Hills. For practicability of slopes. See Slopes, Appendix A, page 148.)

STREAMS.—(See Rivers.)

SUPPLIES.—Location; kind; amount; state of preservation; how stored; accessibility to wagon roads, railroads, electric freight lines, or water communications.

TELEGRAPH AND TELEPHONE LINES.—Name of the company or parties owning the line; principal places connected, nearest offices and connections; main offices; number of wires; kind and height of poles; number of poles per mile; condition as to repair.

Each telegraph and telephone pole may be numbered; only those nearest culverts, bridges, crossings, etc., may be numbered, or only one pole in each mile may be numbered. In any case, the poles numbered are numbered consecutively throughout the superintendent's division in which the poles belong. The first number is on the pole nearest the superintendent's headquarters.

Wires strung so that they cross at intervals denote telephone wires. This is done to prevent induction and the crossing of the wires is called

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a transposition. *Telegraph wires are not strung this way, as a rule.*

Long-distance telephone wires are generally of copper. Telegraph wires are generally of galvanized iron.

Telegraph poles carrying many wires average about thirty poles per mile. Branch lines or poles carrying fewer wires average not less than twenty poles per mile. Poles with round black markings in the centers are mileage poles.

TROLLEY LINES.—(See Electric Lines.)

TROOPS.—*Moving:* Enemies or friends; location; formation; number of each arm. (For Estimation of Strength of Troops Passing, see Appendix A, page 149.) Direction and rate of speed moving; road or roads being used; amount and kind of transportation; morale (cheerful or depressed). What is the evident intention, action, or destination.

Stationary: Enemies or friends; location; position; formation; number of each arm; amount and kind of transportation; kind of shelter, water, fuel, forage, and food supply; formation; means taken for defense; positions of outposts; lines of attack and retreat; surrounding ground. Is it the evident intention to remain or are prepara-

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tions being made for departure? If so, what is the destination? Are there any aeroplanes or balloons in evidence?

TOWNS.—Location; number of inhabitants; principal occupation of inhabitants; material of which most houses are constructed; estimated extent in hundreds of yards or miles of territory covered; water and food supply; lines of communication (telegraph and telephone lines, navigable waters, railroads, electric lines, and wagon roads); location of hospitals; military supplies; garages, railroad depots, wharves, and all public buildings. Look at it from the standpoint of attacking or defending it. If the town is small, what is the general shape of it?

WATER.—*"Good drinking-water should be bright, colorless, odorless, free from sediment, of pleasant and sparkling taste."

Purity: There is no way of being absolutely certain of the purity of water simply by an inspection. However, the impurity of water may sometimes be detected by inspection; therefore inspect. See that there is no chance of pollution of supply by drainage from polluted sources, such as drains, sewers, or surface drainage.

*Manual of Military Field Engineering, by Major Wm. Beach.

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Amount: Each man requires from 4 to 5 gallons per day for all purposes in camp. "A company requires at least two barrels of drinking water daily." (F. S. R.) Horses, mules, and cattle require from 6 to 10 gallons per day.

A report on water should answer the following questions: Is the water easily accessible for every purpose for which it will be required? If not, can it be made accessible? If so, how? If the supply is not sufficient, can it be increased? If so, how? Can reservoirs be constructed so that no waste will occur? Damming a stream is frequently resorted to for this purpose. Is the supply liable to become exhausted in certain seasons? If so, what seasons? Is the water pure? Why do you think so?

WELLS.—Location; number; kind (Artesian, dug, or driven); if dug, find the depth of water and diameter of the well (For Calculation of Amount of Water in a Dug Well, see Appendix A, page 150.) What buildings or human habitations are near? What is the means of drawing water from the well.

WOODS.—Location; extent; kind; height and estimated age of trees; distance of trees apart; underbrush; roads; streams; soil. How far can you see into it? No detail is so small that it may not be important.

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You have only a very limited idea of everything that is going on and can therefore have no idea what bearing an apparently trivial thing may have on the main issue; therefore observe everything coming under your observation that has any military features. When you have reported the information after which you were sent and time and opportunity permit, report anything additional which you may think of value.

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CHAPTER VI.

MAKING ONE'S WAY ACROSS COUNTRY.

A scout should consider it a point of honor never to get lost. Provided he has received sufficient and proper information and description of a place or locality, he should be able to find his way to any place at any time under any reasonable conditions, even in a strange or foreign country. Day and night should be the same to him. Nothing short of capture, a mortal wound or death should prevent him from carrying out his mission.

Practice in peace is necessary. Willingness, energy, good health, intelligence, fidelity, and patriotism are all requisites, but are not sufficient. Next to the requisites mentioned, training is of the greatest importance.

Scouting duty is usually performed by a few men and frequently by one scout acting alone. Although several men may begin a reconnaissance, they may become separated by many causes, and a scout may find himself thrown on his own resources in endeavoring to carry out his mission and in caring for his own safety. It is then that a scout's training

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counts. It inspires in him a consciousness of power, a feeling of superiority, and a contempt for fear which will carry him to the accomplishment of his mission, unhampered by any mental stress.

A Scout's Best Friends.—The best friends that a scout has, when separated from his comrades, are:

(1) His eyes, ears, and nose;
(2) His horse;
(3) His rifle and revolver.

These are mentioned in the order of their importance and will be considered in that order.

(1) Your eyes, ears, and nose give you the knowledge of your whereabouts and the location of the enemy. They are the means by which you acquire information, which is the object of scouting, and at the same time afford you protection.

By continued practice in observing objects at a distance you will find that your range of vision will increase to a great extent. The construction of the eye of an Indian is no different from the construction of the eye of a white man. But the average Indian can see much farther than the average white man. This is because the Indian uses his eyes in the open continually, and in observing objects at long distances. The use of field-glasses is a great aid and places you at an advantage over an enemy without them.

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The sharpness of your ears may enable you to detect the presence of persons and animals even if they are not visible. There are certain sounds which you are accustomed to associate with certain well known actions because you are used to seeing the act and hearing the sound at the same time. Other sounds are not so common and little attention is ever paid to them. To a knowledge of them and an appreciation of their significance you may at some time owe your life.

Go out alone into the woods, fields, or on a road. Sit down quietly. Shut your eyes. Note the various sounds you hear, no matter how slight. Try to reason out what causes these sounds. Investigate and see if your reasoning was correct. Everything has some significance, even the startled cry of a bird.

The nose must not be neglected. The sense of smell of wild animals that live by their wits is most highly developed. This is true also of savages. The following are a few of the observations which may be made by the nose: recognizing the presence of fresh horse droppings in the dark; noting fires; the presence of a man smoking (men who do not smoke themselves have the advantage here); your proximity to the sea-coast may be made known by the salty smell in the air; your nearness to a fishing village may be detected by the fishy smell; most places inhabited by Filipinos have an odor all their own, which, once learned, will

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not be quickly forgotten (the same is true of the Chinese and Moros, but the odors are not the same); some wild animals which you may have need to avoid give warning of their presence by an odor; etc.

(2) You would not have so wide a range of obtaining information if it were not for the comparative ease and swiftness with which you are carried over long distances by your horse.

Keeping your horse constantly in the best condition is second in importance only to keeping yourself fit. Too much importance can not be attached to this. Your horse is also frequently the means of getting your information back quickly, in time to be of use.

If you are warned of danger by your eyes, ears, or nose, your business is not to fight, but to "make your get away." Your horse is the quickest and easiest means of doing this. Your horse has instincts which you can utilize. His hearing is also much more acute than yours. He will frequently detect the presence of persons or animals before you do. He tells you about it by suddenly coming to attention, holding his ears forward in an alert position, and gazing intently in a particular direction. Find out what causes him to do this. He may want to paw the ground or whinney. Stop him. It may give away your presence to an enemy. To stop pawing, attract his attention by jiggling the bit; back him or hold up a foot. To stop

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a horse whinneying, shut off his wind for a second or two by squeezing his nose.

(3) When alone or in a small party, never become separated from your rifle and revolver. If you dismount for any purpose, no matter how long, take your rifle out of the boot and carry it with you. If you do not do this, your horse may become frightened, break away from you, and leave you on foot with only your revolver for protection. Do not place your rifle on the ground or against a tree; you may forget it. It is best, while scouting, never to quit it at all, but to keep it attached to you or in your hand.

If you are out over night and intend to sleep, put one arm through the sling and the rifle inside your blanket with you. Remember you are after information and are not attempting to injure the enemy by killing him. Leave that to the rest of the army, unless especially instructed to do so on some special mission. However, if you are hard pressed and can not get away without fighting, fight, if it will do any good. You can not kill the entire hostile army, but you may be able to delay small pursuing parties by a few well-directed shots. When the parties are delayed, increase the distance between you and them and try to delay them from another position. Or "make your get away" entirely.

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FINDING THE POINTS OF THE COMPASS.

The first requisite for knowing your own location or finding your way in a strange country is a knowledge of the points of the compass. *The easiest and simplest way of doing this is to have a good compass and use it. **However, your compass may be lost or from any one of a variety of causes may have become unreliable. There are several methods of determining directions, sufficiently accurate for our use, without the use of a compass:

(1) You know that the sun, as we say, rises in the east and sets in the west. If the sun is either rising or setting and is not obscured by clouds, the points of the compass are easily determined.

(2) If in the United States, look at your watch a little before noon. When the hands point exactly to 12:00 o'clock, turn your back squarely toward the sun. You will then be facing approximately north.

**Note.*—Some compasses are now manufactured, for night work, which have a luminous dial and a non-luminous needle or *vice versa*.

***When using a compass, remember that the proximity of anything made of iron or steel, such as your rifle, revolver, or saber, will affect the needle and cause it to swing away from the magnetic north.

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(3) Place your watch on a flat level surface with the hour hand pointing toward the sun. (Fig. 8.)

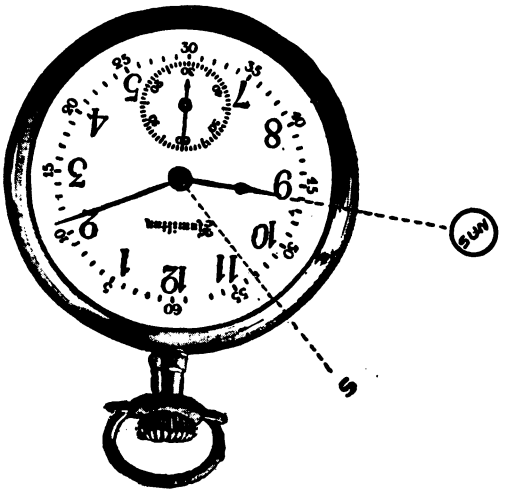

Fig. 8.

A line from the center of the dial to the point half way between the hour hand and the figure 12 (on the shortest distance between the hour hand and the figure 12) will point approximately south between 6:00 a. m. and 6:00 p. m. After 6:00 p. m. and before 6:00 a. m. it will point approximately north.

A pin or match stick, when held horizontally so as to cast a shadow on the hour hand, is a great aid.

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With your watch in front of you, you know whether it is morning or afternoon. In the morning the sun is in the east and in the afternoon it is in the west. From this you can tell which end of your north-and-south line is north.

(4) Take a map of the territory you are in. Place it so that any line on the map which represents a line on the ground is directly over or parallel to the line it represents on the ground. The same relative ends of the line on the map and the line on the ground must lie in the same direction. This is called *orienting* the map. The north of your map will then be pointing toward the actual north. The top of a map is generally north if the map has no north point or arrow pointing north.

You may use any line on the map which you can recognize on the ground, as a railroad, a road, or a line of telegraph wires. You may draw a line on the map connecting any two recognized points and use it in the same way in its relation to the corresponding imaginary line connecting the same two points on the ground.

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(5) The Pole Star or North Star, seen in the northern sky on starlit nights, indicates the north. You may find it as follows: (Fig. 9.)

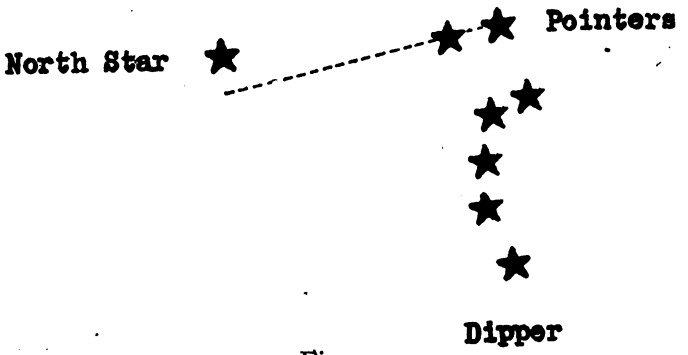

Fig. 9.

A constellation of stars known as "The *Dipper," from its shape, has two stars which are known as pointers. These pointers are in the bowl of the dipper. A line drawn through them, about six times the distance between the pointers in length, will nearly touch the North Star.

(6) Due to the effects of the sun, from its position in the south, there are some physical conditions which, if noted, will give an idea of the general direction of the points of the compass.

*This constellation is also known as "The Plow" and is a part of the constellation known as "The Great Bear."

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(*a*) Ferns, moss, and late flowers are found on the north side of hills. The north side of hills is generally greener than the south side at all times of the year.

(*b*) The bark of a full-grown tree which stands alone and is in no way protected will appear harder, lighter, and drier on the south side than on the north. The north side will show the bark darker, and frequently moss can be found between roots which are above the ground. The hard-wood trees, such as oak, ash, and elm, are especially liable to show mossy growths on the north side. Also, the leaves are longer, of a darker green, and have lighter veins on the north side than those on the south side of the same tree.

(*c*) A cut stump, especially if sawed, will show the rings or circles, which appear on the inside of the tree in the wood, thicker on the south side than on the north side of the stump. The heart of the stump is therefore nearest the bark of the tree on the north side. The shortest line which can be drawn from the heart of the stump to the bark of the tree will then lie toward the general direction of north.

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(*d*) Leaves and twigs of small bushes in a marsh will generally show the same conditions relatively to north and south as do trees.

(*e*) Stones and other articles which have rested on the ground a long time frequently have moss on their north side or in the shadow cast by them to the north. If there is moss all around, it will probably be thinner and drier on the south side of such objects than on the north.

(*f*) In winter trees with rough bark may show nests of insects in the holes and crevices between the lines of bark on the south side.

Note.—All these conditions of moss and trees are true only in places where the objects near which the moss is found are exposed to the sun and are not down in hollows or otherwise protected.

(7) Each territory has its own peculiar features, some of which are always the same in their relation to the points of the compass in that particular territory.

The following are some features which should be looked for and their relations to the points of the compass noted:

(*a*) Water sheds all run in the same general direction, in some territories.

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(*b*) Near the sea coast the general courses of all large rivers would probably be toward the sea.

(*c*) During certain seasons of the year there is a wind which prevails from a fixed direction, between certain hours of the day, in some territories.

Any territory, on inspection, may show many other features which have a similar relation to the points of the compass.

USE OF MAPS.

The use of maps of a territory in which an army is operating is a matter of necessity, in all military operations. By intelligent study of a correct and complete map you can become perfectly familiar with the country it represents, without ever having ridden a foot in any part of it.

The value of a correct and full map to a scout, provided he has the ability to read it, can be readily appreciated. The subject of "Map Reading" is too large to be treated here, however, and I must assume that you have some knowledge of it.

Orientation.—Placing a map in such a position that its north is pointing toward the actual north is orienting the map. A map so placed has all the features represented on it in the same relation to the points of the

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compass as the same features on the ground bear to the points of the compass. To properly read a map it is necessary to orient it.

There are several ways of doing this. One way was shown in paragraph 4, page 104. The method in general use is to find the north, by any of the means previously explained, and then point the north of the map in that direction.

Military maps are collected during peace by the General Staff of the Army and are issued to certain officers when the army takes the field. These maps are not necessarily correct at the time they are issued, as the military features of a country are constantly changing. For example—since the map was made, a bridge might have been constructed over an otherwise impassable river. This bridge could not be on that map. For the bridge to be placed on the map, after the map was made, it would be necessary for a scout or some other person to report its existence and exact location, after observing and possibly sketching it. This brings to our notice the necessity for a scout being able to sketch. (See References for Sketchers, page 152. Sending Sketches by Wire, page 129.)

There are certain kinds of information relative to topographical features which are almost incapable of expression in any other way than on a sketch. A few lines properly placed on a sketch convey more infor-

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mation than volumes of writing. Reports, when practicable, should be supplemented by sketches.

The maps available at headquarters from which a scout might be sent out would ordinarily be few in number, with no duplicates. If a scout is given a map, it would probably be an incomplete copy of that portion of the territory which he is to cover. Again, he might only be given a chance to look at the map. Or, what is more likely, he would be given only directions which had been taken from the map by someone else.

Civil maps generally include only such features as prominent cities; large rivers; extensive mountain ranges; railroads; the divisions into countries, states, provinces, coast lines, etc.; and would show few features of military importance. They can, however, be made very valuable, accurate, and full, by the scout himself.

A scout should use every means within his power to gain possession of any maps relating to the territory in which he is operating, whether they are civil or military. In friendly civilized countries, maps might be obtained from the public surveyor. Automobile clubs and garages might, possibly, have road maps of value. By taking the most complete and accurate map in his collection, a scout may add to it information contained on other maps, information which he obtains himself, while scouting, and information

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given to him by friendly scouts of his own command.

When you have your map posted with all the features and information in your possession, practice with it in your tent, and store in your mind, for future use, the information it contains. Your map may become lost or damaged, or you may not have time to look at it after you get your orders.

Take a trip, in imagination, on some selected road on your map. Start at a given time of the day or night. You know where the sun would be and the direction the shadows would fall at that hour. If at night, you know in what direction to look for the North Star.

From the map, build the country in your mind. See what prominent natural features there are which would attract your attention if you were actually on the ground. Take them in the order in which they would come in traveling the road. See where they are situated in relation to the points of the compass and to each other.

Pick out a place, at haphazard, on the map. Imagine you had been ordered there on a special mission. Consider the various ways of getting there and returning, in connection with the special requirements of your imaginary mission.

When more than one route is available, the choice of routes depends upon which of the following re-

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quirements is considered of the greatest importance:

(1) Speed.

(2) Concealment.

(3) Saving your horse.

(4) Information to be gotten *en route*.

(5) Certainty of getting there, irrespective of anything else.

All of these are important in the carrying out of any mission, but each special mission has its own particular needs, which may necessitate the consideration of one of these requirements before all the others.

PREPARATION FOR ACTUAL SCOUTING.

Before starting out, a scout should be sure that he possesses and thoroughly understands all of the information obtainable regarding the following:

(1) His *mission*.

(2) All known locations of all detachments of the enemy and main body.

(3) Locations of all detachments of his own army and main body.

(4) Direction, distance, and place he is to scout.

(5) Information of the routes he is to travel, including that for the return trip, if necessary.

(6) Where he is to send messages and reports.

(7) To whom he is to send messages and reports.

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When scouting, only such articles as are an absolute necessity to the efficiency of the scout and horse and will aid in carrying out the scout's mission should be taken. All other articles should be left back with the scout's command. A scout must "travel light." The selection and inspection of the articles to be taken should include:

(1) Rations for scout:
    2 Haversack rations (F. S. R.).
    1 Emergency ration (F. S. R.).
    —
    3 Days.
(2) Grain for horse—as much as can be carried.
(3) Canteen of pure water.
(4) First aid packet.
(5) Extra fitted horseshoes (1 fore and 1 hind) and nails—means for shoeing "cold."
(6) Wire-cutters.
(7) Ammunition—90 rounds for rifle (F. S. R.), 20 rounds for revolver (F. S. R.).
(8) Only such articles of the soldier's equipment as are absolutely necessary.
(9) All articles of scout's equipment (see Appendix A, page 139.)
(10) Maps of territory to be traveled, posted with all information obtainable.

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ACTUAL SCOUTING.

While your mind is occupied with remembering and carrying out these matters in which you have been instructed, do not forget that these matters are important only as they aid you in carrying out your mission. When you are trusted with a mission, it is because it is important that it be carried out. If you fail, due to obstacles which you could have surmounted or brushed aside, the trust was misplaced.

If you allow such matters as the presence of the enemy or a stream without a bridge to prevent you from carrying out your mission, your place is back in the ranks.

When you have completed your preparations and start on your mission, if you will remember and carry out a few little points I am about to give you, your chances will be good for finding your way in a strange country and successfully returning with your mission accomplished.

RULES FOR FINDING THE WAY IN A STRANGE COUNTRY.

Before starting out, note the following:

(1) The original direction in which you start.

(2) The direction, by the way the bird flies, in which your destination lies, from your point of starting. This you can get from a map.

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(3) Any prominent landmarks near your starting-point, such as mountains, church-spires, etc. These serve as guides when returning.

As you go forward, note the following:

(1) The number of changes of direction you make.

(2) The direction in which each change of direction is made.

(3) Prominent features which may be seen at a distance, along the route, and where you were when you saw them.

(4) Where railroads, rivers, canals, chains of mountains, etc., run parallel to your route. Also, how far they run parallel.

(5) How far you have come, when you come to cross-roads, railroads, villages, etc.

(6) The location of any peculiar features, such as a lone tree, an odd-shaped rock, etc.

(7) *Look back frequently* and see what the country would look like if you came back that way.

If you are using a map, do not be surprised or immediately conclude that you have gone wrong if you come to a feature which is not on your map. The sketcher who made your map may not have considered it of sufficient importance to note. Or, if it is not a particularly prominent feature, he may not have noticed it at all. Sketchers are human and liable to err. Again, the feature may not have been there when the

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map was made. It is possible for you not to find all the things on the ground which are shown on your map. Such a thing could happen. For instance, you may be looking for a road, instead, you find a line of fence with a plowed field on the other side. The fence could easily have been erected across the road, the field plowed and all traces of a road obliterated, since the map was made.

Lost! It is a horrible thing to contemplate, not on account of the immediate consequences which may ensue, but, think of the disgrace! However, you may get lost, especially at first. If you are so unfortunate as to lose your way, stop. Think of how you are going to find it. Do not lose time by thinking of all the gruesome details of what may happen to you. If you do, they may happen.

(1) Go back in your tracks until you come to a place where you knew you were right. Then, start out again.

(2) Go to an elevation or climb a tree and look over the country for landmarks which you have noted in their relation to the locality to which you wish to go.

(3) If you have a map, orient it. Note some prominent features in your immediate vicinity which you might expect to find on the map. Locate them on your map and so—find yourself.

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If you are lost in a fog, in the confusing winds and snow drifts of a blizzard, or in the blackness of a starless night, the difficulties of extricating yourself have increased. A reliable compass is at such times a great comfort. But remember this: if a horse has been kept in one place for a little time, he will remember that place better than you, and will know the way back far better than a human being.

There is a difference between being lost and temporarily losing your way. After you have done the latter and have exhausted every means known to you and you are still unable to find your way, you are lost.

However, such a thing would be unusual. With your training and sharpened sensibilities, it should be impossible. We will consider that you have obtained the information for which you were sent out and it only remains for you to report it. We will consider this in the next chapter.

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CHAPTER VII.

MEANS AND METHODS OF REPORTING.

Information is transmitted as follows:

(1) By wire (telegraph, buzzer, telephone).

(2) By visual signalling (flag, helio, night lamp).

(3) By radio telegraph (*formerly called wireless).

(4) By messenger (foot, mounted, cycle, motor car, flying machine).

Information transmitted over considerable distances is transmitted by wire or wireless of the Signal Corps, if available. If the Signal Corps has not established communication, use the commercial lines if they are in the hands of the military authorities and a messenger service has been established at headquarters.

Mounted messengers, at urgent speed for messages of ten words, are used up to distances of about half a mile. A message of that number of words can be delivered more quickly by a mounted messenger than by wire.

*"In conformity with international usage, the word 'radio' will hereafter be used to designate 'wireless' and the word 'radiogram' to designate 'wireless telegram' and 'wireless message.'" (Par. VII., G. O. 15, W. D., series 1912.)

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If a mounted messenger is used, he should receive the following instructions:

(1) To whom he is to take the message.

(2) Where that person can be found.

(3) What route to use to get there.

(4) What rate of speed to travel.

(5) What he is to do, after delivering the message, in the absence of further orders.

(6) Make him repeat his instructions.

(7) If you are sending a verbal message, make the messenger repeat his message.

Note.—This chapter is based on principles and methods laid down in the Field Service Regulations, and in some cases the Field Service Regulations are quoted *verbatim.*

"Messages carried by messenger are usually enclosed in envelopes, properly addressed. The envelope, when not marked 'Confidential,' is left unsealed so that commanders along the line of march may read the contents. Upon the envelope is written the name of the messenger, his time of departure, and rate of speed."

The latter is indicated as follows:

Ordinary—About 5 miles an hour for a mounted man.

Rapid—About 7 or 8 miles an hour for a mounted man.

Urgent—The highest speed consistent with certainty of arrival at destination.

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"The recipient notes the time of receipt upon the envelope and returns the latter to bearer."

"When there is danger of falling into the hands of the enemy, messages are sent in cipher."

"The difficulty of transmitting information by messenger increases with the distance. At night, when the roads are bad, the service is slower; when the inhabitants are hostile or the enemy's detachments active, it is less reliable."

"Information is sent by two or more messengers, depending on the dangers of the road. A single messenger is not so confident, and something may happen to him or his horse. It may also be advisable to send duplicate messages by different routes. Messengers are informed before starting of the purport of the message, and where they are to report after it is delivered. A messenger need not alter his pace when passing a superior."

"When the usual means of communication can not be established, or fail to work, relay lines of mounted men may become necessary. When such lines are established, connecting posts are generally placed on the roads at well-marked points, such as cross-roads, bridges, etc. The distances between posts depends upon the rapidity of transmission desired, the number of men available, and the location of suitable stations. The usual distance is from five to ten miles. The

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strength of such posts varies from six men and a non-commissioned officer to half a troop. A record is kept at each post of all communications received and transmitted."

All scouts should be reliable signalmen in good practice. The advantages of scouts being able to communicate by visual signalling can not be overestimated.

Reports relating to the terrain, positions, ranges for fire, etc., should be accompanied by sketches made by the scout. A sketch makes a report clearer and contains more information than a volume of worded dispatches.

In reporting it is well to remember the following:

RULES FOR REPORTING.

(1) *Get information back quickly.* No matter how accurate or important the information you have may be, it is of no value to your commander until he gets it. If it is late in getting to him, it may be worthless and your work will be lost.

(2) *Do not report what is already known.* Unless ordered to do so, do not report information which has already been reported. It takes up valuable time. Other things are happening which you may lose and the information sent back is of no value.

(3) *Do not report what will arrive too late to be of value.* If you are in front of a moving body of troops, remember that shortly those troops and your

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commander will be where they can see for themselves the same things which you see. Unless you can get that information back to your commander before he gets where he can see for himself, it is a waste of time and energy to send such information back.

(4) *Report only facts.* Do not report your own deductions or calculations. If there are any deductions or calculations to be made, let the commander make them. You may and should make your own deductions and calculations, but they are for your own information and are simply to help you in getting more information. They are not a matter for report.

(5) *Do not use general or comparative terms.* If you say, "A large body of the enemy," that may mean a squadron or a division. Give numbers when you can. Calls things by their names. Be accurate.

(6) *Use the points of the compass.* In referring to places or positions, use the points of the compass in expressing yourself. Do not use the terms "right" or "left." You may say "right" or "left" when referring to the banks of a stream, as the banks are on your right or left when you are facing down-stream. That and when referring to the flanks or wings of a body of troops are the only cases where the terms "right" or "left" should be used.

(7) *Never use the term "I think."* Nobody wants to know what you think. Only what you know is of

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any value. If you do not know anything, but think something, say nothing. Keep your "thinks" to yourself, unless you are asked for your opinion. You will probably not be asked.

(8) *State your source of information.* If you are reporting first-hand information and know what you report to be so from your own personal observation, say so. Say, "I saw so and so." If you are reporting second-hand information—something which has been told you, say so. Say, "A member of my patrol reports," etc. Or, "A friendly inhabitant of X states so and so." If you can verify second-hand information before reporting it, do so. If you are doubtful about the truth of any second-hand information, it is better not to report it. If you do report it, call attention to the fact that it has not been verified.

(9) *Be frank in reporting.* Do not try to mislead your commander, even to cover your own ignorance or carelessness in observation. Say, "I do not know." But do not get caught in the same trap again. Know the next time. There is too much at stake, too many people and large issues involved for them to be put in danger by one man. The trust imposed on you is too valuable to you, to the Army, and possibly to the country, to be treated lightly

(10) *Messages from a distance,* five miles or more, should be full, as they are few in number.

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(11) *Your future actions.* At the end of a report not made in person, state what you intend to do next.

PERSONAL VERBAL REPORTING.

When coming in to report your information yourself, remember the information you were sent after. Put it in short direct sentences, as if you were wording a telegram, for which you were paying a dollar a word. On your way in, say these sentences over to yourself. See if you have them right. See if they express what you mean. Try not to come in out of breath. Report quietly, distinctly, and without hesitation. Report the information after which you were sent. Then, if time and opportunity permit, add anything else you may think of importance.

VERBAL REPORTING BY MESSENGER.

When sending a message, verbally, by another man, boil your message down to the fewest possible words that will say what you mean. Each sentence should contain but one idea. Then give your messenger the instructions contained at the top of page 119.

It may be necessary to find an officer marching with a column, in order to report information. You will have to take the following things into your calculations in order to get any idea as to when and where you are going to be able to reach this officer:

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(1) Distance between you and the line of march of the column.

(2) The direction of the line of march of the column.

(3) The rate of march of the column.

(4) The speed of the messenger.

Ask yourself whether or not your information will be of any use to the officer when you get it to him.

WRITTEN MESSAGES.

For written messages, use the blanks prepared for the purpose of sending written messages as furnished in the *"Field Message Book, U. S. Army,"* and observe the following:

(1) Follow the directions in the Field Message Book.

(3) Keep copies of all messages sent.

(3) Do not forget to underscore means used, in upper left-hand corner of the form

(4) Sign your surname and rank only. Example: "Jones, Sergt."

Become so familiar with the form of the Field Message blanks and the form of the envelopes used with them that you will be able to follow them, although you may only have blank paper and plain envelopes.

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"The heading 'From' is filled in with the name of the detachment sending the information, as 'Officer's Patrol, 7th Cav.' Messages sent on the same day from the same source to the same person are numbered consecutively. The address is written briefly—thus, 'Commanding Officer, Outpost, 1st Brigade.' In the signature the writer's surname only and rank are given."

"This blank is 4½ by 6¾ inches, including the margin on the left for binding. The back is ruled in squares, the side of each representing 100 yards on a scale of 3 inches to 1 mile, for use in making simple sketches explanatory of the message. It is issued by the Signal Corps in blocks of 40 with duplicate sheets." (F. S. R.)

Signal Corps Form 144a.

FIELD MESSAGE—U. S. ARMY.

To ..... No.....

(For Signal Operators Only)

When sent..... No.....
Rate of speed..... Name of Messenger .....
When and by whom rec'd.....

THIS ENVELOPE WILL BE RETURNED TO BEARER.

Above is shown the Regulation Envelope for use with the Field Message blank.

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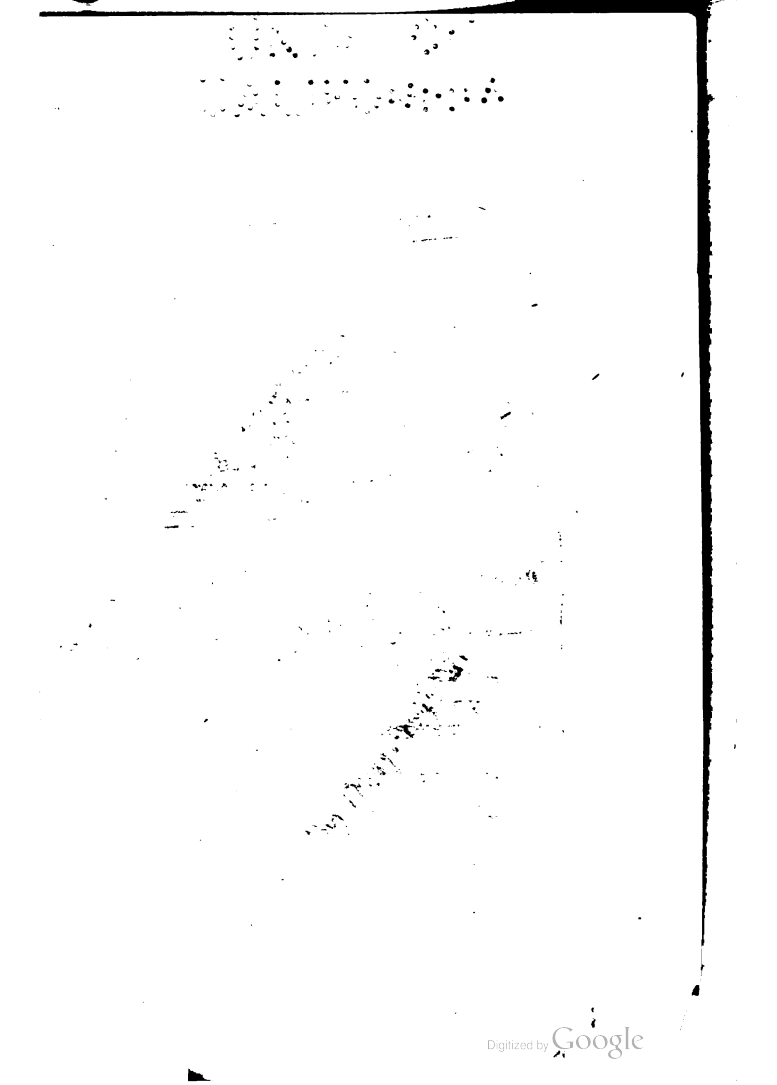
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SENDING SKETCHES BY WIRE.

Mention has been previously made regarding the value of supplementing reports by sketches. When a report or a message is sent by wire, the possibility of accompanying it by a simple sketch may not be so difficult as at first it may seem.

WHEN NO SKETCH IS PLOTTED BY SCOUT.

Method: When preparing a sketch which you wish to send by wire, you need not actually make the sketch yourself. But you must make the observations necessary for the sketch and make a record of your notes as you would if you were going to plot the sketch later. Your notes for a simple sketch would include the following:

(1) The length and direction of your base line.

(2) The angles of sights to objects from each end of your base line, expressed in degrees

(3) The positions of the objects to be plotted as fixed by intersecting sights, expressed in degrees, from different positions already fixed in your notes, etc.

These notes, if you make them sufficiently clear for anyone to understand them, can be sent by wire to headquarters, where a topographer can plot them, when time and facilities permit, and a simple sketch can be produced, which may be of value.

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These are only suggestions. Doubtless thought and practice on your part will produce many more items in your notes. But care must be exercised that your notes be not too elaborate and that you do not attempt too much. Such sketches must be very simple and meager in detail.

METHOD WHEN SKETCH IS PLOTTED BY SCOUT.

This method could be used in reporting to headquarters where a permanent Information Division had been established and where paper prepared for the purpose could be obtained.

A sketch could be obtained more full in detail by this method than by the method just explained.

*"The diagram or sketch is drawn upon coordinate or double cross-ruled paper."

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*This article is used by special permission of the *Popular Electricity Magazine*. The method originally appeared in the *Journal of the United States Cavalry Association*.

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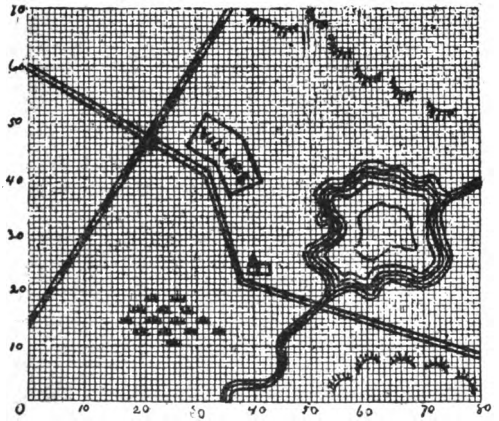

MAP PLOTTED FROM A TELEGRAPH MESSAGE
Fig. 12.

"Now each point on this paper can be determined by a pair of numbers. These numbers, which are called the co-ordinates, are derived in this way: Each vertical line is numbered, starting from the lower left-hand corner of the paper; starting from the same point, each horizontal line is also numbered. The intersections of the lines can then be determined simply by giving the numbers of the intersecting lines, the first number given being for the vertical lines. The numbers are written with a comma or a dash separating them. Thus the pair '20, 13' means the point of

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intersection of the two lines, one of which is 20 units to the right and the other is 13 units above the lower left-hand corner. In a similar way any point on the paper can be located, and located very rapidly, for a little practice in this work gives one remarkable facility."

"The location of a shed, a house, a tree, or any comparatively small single object on the sketch is designated by a single word and a pair of numbers, as 'barn 3, 17.' Objects like roads, fences, streams, and shore lines are easily determined by giving co-ordinates of successive points. Straight sections of roads or fences require only the co-ordinates of the extremities, as the straight line can be supplied. The width of a river can be determined by expressing its width as it appears on the sketch in cross-section units, as 'river 4 wide,' followed by the series of numbers which indicate the course of its middle line. Areas like marshes, or wooded tracts, are determined by giving the numbers which indicate their boundaries."

"The map, sketch, or diagram then is drawn upon this paper, and a supply of the same kind of paper is in the hands of the man at the other end of the line. To transmit the sketch the features are transcribed as has been shown, and this data is sent by telegraph, telephone, or wireless to the destination. By plotting from this data on the same kind of paper the sketch

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can be reproduced most accurately, the degrees of exactness depending only upon the number of points which have been furnished. To one who has never done this kind of work, it would appear a slow and tedious task. As a matter of fact, it is remarkably swift in its operation, as an ordinary field map, such, for instance, as would be drawn by a scouting party, can be transmitted and reproduced, exactly to scale, in about a half-hour."

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Appendices.

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Appendix A.

GENERAL INFORMATION.

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GENERAL INFORMATION.

Abbreviations.—The following abbreviations and designations are authorized in the Field Service Regulations for use in orders and messages.

When these words are used they must be written in full or abbreviated as shown. Also, these abbreviations must not be used to designate words other than those shown below.

Afternoon .....P. M.
Ambulance Company....
.....Amb. Co.
*Artillery (Field)...F. A.
Battalion .....Bn.
Battery .....Btry.
Brigade .....Brig.
Cavalry .....Cav.
Company .....Co.
Dates are abbreviated thus:
4 Feb. 08, 2-45 P. M.
Detachment .....Det.
Division .....Div.
Engineers .....Engrs.
Field Hospital....F. Hosp.
Infantry .....Inf.
Morning .....A. M.
Night...Both days should be mentioned thus:
Night 4-5, Feb. 08.
Noon and Midnight are written out in full.
Platoon .....Plat.
Regiment .....Reg.
Section .....Sec.
Signal Corps...Sig. Corps.
Squad (write in full)..
.....Squad.
Squadron .....Sq.
Troop .....Tr.

Titles are expressed as follows:

Det. 1st Div.
Outpost; 1st Bn. 6th Inf.
Advance Guard, 1st Sq. 5th Cav.
1st Brig. 1st Div.

---

*There are no abbreviations given in the Field Service Regulations for Horse or Mountain Artillery. It is recommended that they be written out in full: Horse Artillery or Mountain Artillery.

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Camps.—*Dimensions of Camps.* (F. S. R.)

(War Strength—Pyramid Tents.)

	Yards.	Acres.
Infantry:		
Regiment	300 by 300	19
Brigade		60
Cavalry:		
Squadron	150 by 284	9
Regiment	530 by 284	33
Brigade		100
Artillery:		
Battalion	280 by 370	22
Regiment	620 by 370	48
Brigade (2 Regiments)		100
Engineers (Pioneer):		
Battalion (Same form as battalion of artillery)	200 by 360	15
Signal Troops (Field):		
Battalion (Same form as battalion of artillery)	140 by 300	9
Sanitary Troops:		
4 Ambulance Companies	240 by 290	15
4 Field Hospitals	240 by 260	13
Ammunition Train	100 by 220	5
Supply Train (including sanitary reserve and division field bakery)	140 by 220	7
Pack Train	40 by 65	1
Division		400
Cavalry Division		400

"With the same width of streets and the tents of each company in one line (1 man per yard), the dimensions of camps, when shelter tents are used, will be the same as above. By reducing the width of streets the dimensions of camps can be reduced accordingly."

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"While a division may be encamped on 400 acres, the nature of the terrain will generally render a square mile or more of ground necessary."

Note.—By reference to the above, a scout sent to find a camping-place may determine the amount of ground necessary for any command. (See Measures, page ...)

Coal.—*Estimation of Amount in Tons.*

Anthracite (Hard) Coal, 1 ton=about 37 cu. ft.
Soft Coal, 1 ton=about 42 cu. ft.

Find the number of cubic feet in the coal to be estimated. Divide this number by the number of cubic feet in one ton, given above, for the kind of coal being estimated. This will give you approximately the number of tons.

Current.—*To Find the Velocity of a Current.*

Pace off any convenient number of feet on the bank. Throw into the swiftest part of the current something which will float low in the water. Note the number of seconds it takes this article to float past the number of feet you have paced off.

Divide the number of seconds by the number of feet passed.

Take 7-10 of the result. This will give you the number of miles per hour the current is flowing.

1 mile per hour is sluggish.
4 miles per hour is rapid.
6 miles per hour is a torrent.

Detachment.—*Definition of a Detachment.* (F. S. R.)

"Detachment is a body of troops separated from a higher command and intrusted with a special mission."

Distance.—*Distance Measured by Time and Gaits.*

If your horse has been gaited to the regulation gaits and you know when he is conforming to them, you

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may estimate fairly accurately any distance you travel mounted.

Note the length of time each gait is traveled.

From the table below, figure the distance traveled at each gait during each length of time noted.

For the total distance, add the distances traveled at each gait.

At a Walk:

In 60 minutes you go 4 miles.
In 30 minutes you go 2 miles.
In 15 minutes you go 1 mile or 1760 yards.
In 7½ minutes you go ½ mile or 880 yards.
In 5 minutes you go 586.6 yards.
In 3¾ minutes you go ¼ mile or 440 yards.

At a Trot:

Twice the distance traveled at a walk is the distance traveled at a trot, for any given time.

At a Gallop:

Three times the distance traveled at a walk is the distance traveled at a gallop, for any given time.

Note.—Alternate walk and trot is estimated as 5 miles per hour. It is not expected that a gallop would be used except for short distances in an emergency.

Equipment.—*Equipment of a Scout.*

A soldier, detailed as a scout, would be in possession of all the articles of equipment ordinarily issued to a soldier for field service. However, on a scouting expedition, he should carry with him only such articles which are absolutely essential to the welfare of himself and horse and are demanded by the requirements of his mission.

The scout must not be hampered by useless impedimenta and his horse must not be overburdened. The fol-

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lowing articles are light in weight and are essential to the work of a scout:

(1) Field Glasses;
(2) Note Book;
(3) Field Message Book;
(4) Pencil;
(5) Watch;
(6) Compass;
(7) Cavalry Sketching Case;
(8) Ruler with Scales.
(9) Map of Country to be scouted.

A camera may also be useful, as it enables a scout to send back photographs of important landmarks, or a panoramic photograph may be obtained from an elevation, etc.

Fords.—*Practicable Depths, How Marked.*

Should not exceed 4 feet for cavalry.
Should not exceed 3 feet for infantry.
Should not exceed 2½ feet for artillery and wagons.
(Above from F. S. R.)

Note.—In sluggish water, with hard level bottom, these depths may be increased.

When it is intended to use fords, especially if they are new, they should be plainly marked. Floats of wood may be attached to weights by ropes or wire and the weights sunk at intervals across the stream in the direction of the ford. Features on the banks at each end of the ford should be noted. Changes of direction in midstream should be marked.

The level of the water on the bank or its height on trees or rocks which are in the water should be noted

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at the time of observation. Also, a stake could be driven in the stream near the bank with a notch on it even with the level of the water. In this way a change of depth can be noted.

Gauge of Railroads.—*Standard Gauge.*

The distance between the inner edges of the heads of the rails, when newly laid, is called the gauge. The "Standard Gauge" in the United States and in most foreign countries is 4 feet 8½ inches to 4 feet 9 inches.

Grain.—*Estimation of Amounts in Bushels, Pounds, and Rations.*

Bushels.

Find the number of cubic feet in the grain to be estimated.

To reduce the cubic feet to bushels: Deduct one-fifth. (This is only approximately correct. The result will be too small by about 4½ bushels for every 1000 bushels of the result.)

Pounds.

In buying and selling grain, the bushel is regarded as a certain number of pounds by the Boards of Trade of the principal cities in the United States, as follows:

Kind of Grain.	One Bushel.
Barley	48 pounds.
Corn (shelled)	56 pounds.
Corn (on the ear)	70 pounds.
Oats	32 pounds.

Multiply the number of bushels found by the above method by the number of pounds in the table. This will

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give you the total weight in pounds of the grain estimated.

Note.—Cavalry Drill Regulations gives 40 pounds as the weight of a bushel of good oats. Therefore, 40 pounds should be used in estimating the rations, while 32 pounds could only be used in buying.

Rations.

Rations of Oats, Barley, and Corn. (F. S. R.)
Horse .....12 pounds.
Mule ..... 9 pounds.

Divide the total number of pounds of grain by the number of pounds in one ration, as shown above. This will give you the total number of rations in the grain estimated.

Hay.—*Estimation of Amounts in Tons.*

When estimating hay in stacks of long standing, ignore the top and sides. One ton will equal a cube of 7 feet per side.

Hay thrown loosely and tramped down, one ton will equal a cube from 9 to 12 feet per side.

One ration of hay for both horses and mules weighs 14 pounds.

Multiply the number of tons by 2000 and you have the number of pounds in the stack.

Divide the number of pounds in the stack by 14 and you have the number of rations in the stack.

Note.—Baled hay weighs about 11 pounds per cu. ft.

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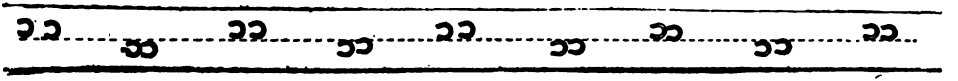

Fig. 13. Walk.

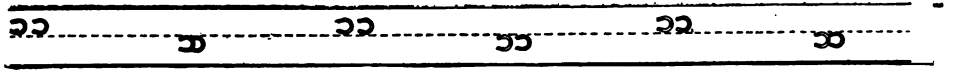

Fig. 14. Trot.

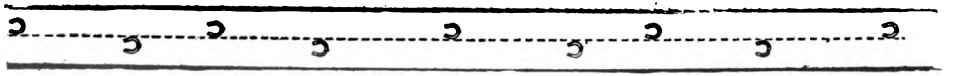

Fig. 15. Gallop.

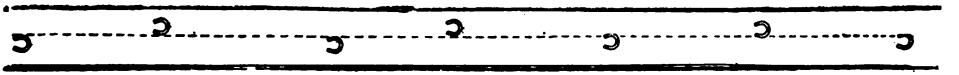

Fig. 16. Fast Run.

The figures below illustrate the tracks made at a walk by horses which step short with their hind feet.

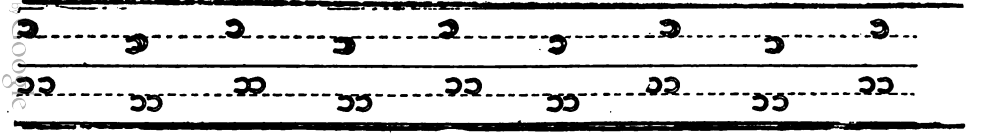

Fig. 17. Short Stepping with the Hind Feet at a Walk.

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Horse's Gaits.—*Gaits as Shown by Tracks.*

The gait of a horse which is being trailed can be determined by observing his tracks. Different horses leave different tracks while traveling the same gait. As many things influence a horse's balance and strides, the same horse will not always leave the same tracks under all conditions.

But, when moving at any fixed gaits, such as the walk, trot and gallop, all horses make tracks which bear more or less the same relation to each other.

This may be seen in the following illustrations.* Figures 13, 14, 15, and 16, page 143, show the tracks made by the same horse at a walk, trot, gallop, and fast run, respectively. The dark shoes represent the tracks of the hind feet. The figures are all drawn on the same scale.

Ice.—*Thickness in Relation to Strength.* (F. S. R.)

3 inches will support small groups of men.
4½ to 7 inches will support cavalry and light guns.
8 to 12 inches will support heavy guns.

Marches.—*Length and Speed of Daily Marches.* (F. S. R.)

Length.

Cavalry marches daily, on the average.....25 miles.
Field Artillery marches same as the command of which it forms part.
Horse Artillery marches same as Cavalry.
Infantry, small commands, on good roads, in cold weather, daily.....20 miles.
Infantry and mixed commands, daily.....15 miles.
Very large bodies of troops average, daily.....12 miles.
Wagon trains average, daily, same as Infantry.

*Maj. Gen. Wm. H. Carter, General Staff U. S. Army, has kindly authorized the use of these illustrations, which are taken from his book, "Horses, Saddles and Bridles."

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Pack trains, average conditions, daily.....20 to 25 miles.
Pack trains, in rough country, daily.....10 to 15 miles.

Speed. (F. S. R.)

Cavalry.	Walk.	Trot.	Gallop.
Drill.	4 mi. hr.	8 mi. hr.	12 mi. hr.
Marches.	3¾ mi. hr.	7½-8 mi. hr.	

Marches, including halts, 3¼ to 3½ miles per hour.

Marches, under favorable conditions, alternate walk and trot, average 5 miles per hour.

Field Artillery, same as that of the command of which it forms a part.

Horse Artillery, same as Cavalry.

Infantry.

Drill 3.4	mi. hr.
Marches 3	mi. hr.
Marches, including halts.....2½ to 2¾	mi. hr
Marches, under average conditions .....2¼ to 2½	mi. hr.
Wagon trains, large mules, under favorable conditions 4	mi. hr.
Long columns, including halts.....2	mi. hr.
Small trains 2½	mi. hr.

Measures.—*Linear Measure.*

Mile.	Rod.	Yard.	Foot.	Inch.
1	320	1,760	5,280	63,360
	1	5½	16½	198
	1	1	3	36
			1	12

Note.—The above is a statute mile.

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1 Geographical or Nautical Mile=1.15 statute mile.
1 League=3 nautical miles =3.45 statute miles.
1 Kilometer=(Metric System) about ⅝ statute mile.

The acre is the common unit of land measure.

1 Acre=a square 208.71 feet x 208.71 feet.
1 Acre=a rectangle 165 feet x 264 feet.
1 Acre=a rectangle 55 yards x 88 yards.

Spanish Weights and Measures.

In many Spanish-speaking countries, although the Metric System may or may not have been legalized, the old Spanish weights and measures are generally used. Some of them are as follows:

1 Libra=1.014 pounds, Avoirdupois.
1 Arroba (25 Libras)=25.36 pounds, Avoirdupois.
1 Quintal (100 Libras)=101.44 pounds, Avoirdupois.
1 Vara=.914 yards, Linear measure.

Cubic Measurements.

To determine the number of cubic inches, feet, yards, etc., contained in a rectangular solid space, measure the length, breadth, and height of the rectangular solid space, reduce these measurements to the same denomination (reduce them all to inches, feet, or yards), then multiply them together.

Square Measurements.

To determine the number of square inches, feet, yards, etc., in a rectangular space, measure the length and width of the rectangle, reduce the measurements to the same denomination, then multiply them together.

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Useful Measurements to Know.

There are some measurements which a scout should know, in order that he may able to use them, in a comparative way in forming estimates of other measurements. In some cases, by their use, rough measurements may be actually made.

Some of them are as follows:

(1) His own pace.
(2) His horse's pace.
(3) His horse's height. (Measured from the top of the withers to the ground. The hand, used in measuring horses, equals 4 inches.)
(4) Height of his own eyes above the ground.
(5) The distance between two joints of some one of his fingers which will approximate an inch.
(6) His reach.
(7) The spread of his arms.
(8) The length of his rifle.
(9) The length of his saber.
(10) The length of his lariat.

Military Crest.—*Definition.*

The military crest is the highest position on a slope from which all the ground below can be reached by fire.

Ranges.—*Classification.* (F. S. R.)

For convenience of reference, ranges are classified as follows:

Range.	Rifle. Yards.	Field Artillery. Yards.	Heavy Artillery. Yards.
Distant. . .	Over 2,000	Over 4,500	Over 6,500
Long. . . .	2,000 to 1,200	4,500 to 3,500	6,000 to 4,000
Effective. . .	1,200 to 600	3,500 to 2,500	4,000 to 2,500
Close. . . .	Under 600	Under 2,500	Under 2,500

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Roads.—*Practicable Widths.*

16 feet wide—Vehicles can pass.
9 feet wide—Vehicles can pass only at turnouts.
9 feet wide—Practicable for infantry in column of fours.
9 feet wide—Practicable for cavalry in column of twos.
6 feet wide—Practicable for infantry in column of files.
6 feet wide—Practicable for cavalry in col. of troopers.
6 feet wide—Practicable for pack trains.

Signals.—*Use of Signals by Scouts.*

To be used when two or more scouts are acting together.

"Enemy in sight in small numbers, hold the rifle above the head horizontally; enemy in force, same as preceding, raising and lowering the rifle several times; take cover, a downward motion of the hand."

"Other signals may be agreed upon before starting, but they must be familiar to the men; complicated signals are to be avoided. Signals must be used cautiously, so as not to convey information to the enemy." (F. S. R.)

To attract the attention of companions at short distances, snapping the fingers or breaking a twig may be resorted to. Similar sounds may be produced by Nature without exciting much attention. However, silent motions are the best.

Slopes.—*Practicability of Slopes.* (F. S. R.)

Slopes from 0° to 5° are practicable for maneuvering all arms, singly or combined.

On slopes from 5° to 10° all arms can still be maneuvered, but with increasing difficulty.

On slopes from 10° to 15° all arms can be moved up or down.

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Slopes from 15° to 30° are practicable for small detachments only.

On slopes from 30° to 45° foot troops can move with difficulty.

War material can be dragged up any slope.

Degrees.	Operations.
1	Maximum for railroads.
3	Maximum for first-class roads.
5	Practicable for all arms; somewhat difficult for cavalry to charge descending.
6	Maximum for cavalry charge in mass ascending; infantry in close order descends with some difficulty.
7	Cavalry can descend at a trot.
8	Not practicable for heavily loaded vehicles.
9	Field artillery can no longer maneuver.
14 to 15	Maximum up to which all arms can move.
18	Light vehicles can ascend.
26	Individuals and mules can ascend or descend.
45	Foot troops can ascend or descend aided by hands.

(See inside of back cover of this book for slope-board.)

Troops.—*Estimation of Strength of Troops Passing.* (F.S.R.)

"The strength of a body of troops may be estimated from the length of time it takes to pass a given point. Assuming that infantry in column of fours occupies half a yard per man, cavalry 1 yard per trooper, and artillery in single column 20 yards per gun or caisson, a given point would be passed in one minute by about—

"175 infantry;
110 cavalry, at walk;
200 cavalry, at trot;
5 guns or caissons.

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"For troops in column of twos, take one-half of the above estimates."

Wells.—*Calculation of Amount of Water in Dug Wells.*

To find the amount of water in a circular dug well with straight sides:

Measure the diameter of the well across the top of the hole. Find the depth of the water by a rope with a weight on it. Get your measurements in inches. Then compute as follows:

Multiply ½ the diameter by ½ the diameter (*i. e.*, square it).

Multiply the result by 3.1416.

Multiply this result by the depth of the water.

Divide this result by 231 (number cu. in. in gal.).

This will give you the number of gallons of water in the well.

Below is the same calculation expressed differently:

½ diam. x ½ diam. x 3.1416 x depth of water= amount of water in gallons in well.

Divide the above result by 231.

This method may be applied to a circular tank as well.

Whistles of Locomotives.—*Significance of Whistles.*

There is little variation in the significance of locomotive whistles used by railroads throughout the United States.

The significance of whistles, other than those stated below would have little application to scouting.

One short blast=Stop. Apply brakes.

Two long and two short blasts=Approaching public crossings at grades.

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One long blast=Approaching stations, junctions, railroad crossings at grade, and mail cranes located between stations.

A succession of short sounds of the whistle means an alarm for persons or cattle on track.

Any object waved violently by anyone on or near the track is a signal to stop.

Wood.—*Estimate of Amount in Cords.*

In measuring wood, a pile 8 feet long, 4 feet wide, and 4 feet high, is called a cord.

Pile the wood and measure the pile. If this is impracticable, estimate what the measurements would be if the wood were piled.

Multiply the length, width, and height (expressed in feet).

Divide this product by 8 x 4 x 4. The result will be approximately the number of cords in the wood estimated.

Example: Pile is 24 feet long, 4 feet wide, and 6 feet high.

$$\frac{24 \times 4 \times 6}{8 \times 4 \times 4} = 4\frac{1}{2} \text{ cords.}$$

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Appendix B.

REFERENCES FOR SKETCHERS.

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REFERENCES FOR SKETCHERS.

SCALES AND VERTICAL INTERVALS.

"In the field the maps available for general use are on a small scale. Those of our own country are prepared by the Geological Survey on a scale of 1:62500 (approximately 1 inch to the mile), with 20-foot contours. These maps are supplemented by field maps or sketches prepared from day to day. For facility in reading, military maps are made according to a uniform system of scales and contour intervals, as follows: 1 inch to 1 mile, V. I. 60 feet; 3 inches to 1 mile, V. I. 20 feet; 6 inches to 1 mile, V. I. 10 feet; 12 inches to 1 mile, V. I. 5 feet.

"As a rule, road sketches are made on a scale of 3 inches to 1 mile, V. I. 20 feet; position and outpost sketches, 6 inches to 1 mile, V. I. 10 feet. The 1-inch map is used for extended operations; the 12-inch map for the war game or for the discussion of operations at maneuvers, and in siege operations."

"As sketches must be made rapidly, often on horseback, unnecessary conventional signs are omitted. Sketches are useful to supplement messages, and elucidate reports of campaigns and battles." (F. S. R.)

The scales of distances and map distances found on the following pages, and the slope-board on the inside of the back of this book, may be used directly from the book when sketching.

The 3 inches to 1 mile scales may be used as 6 inches to 1 mile scales by simply measuring twice, with the 3-inch scales, the distance to be plotted.

By a reference to the Scale of Slopes on page 155, the scales of map distances may be used for sketches drawn to any scale from ½ inch to 1 mile to 120 inches to 1 mile.

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Horizontal equivalents are the horizontal distances on the ground between two contours.

Map distances are the horizontal distances on the map between two contours.

Vertical intervals are the actual distances measured vertically between two contours.

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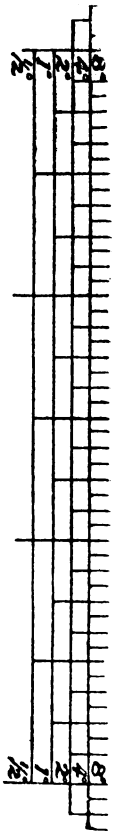
Scale of Slopes for											
Inches to 1 mile.	1/2	3/4	1	1 1/2	2	2 1/2	3	4	5	6	7 1/2
V.I. in feet	120	80	60	40	30	24	20	15	12	10	8
Inches to 1 mile	8	10	12	15	20	24	30	40	60	80	120
V.I. in feet	7 1/2	6	5	4	3	2 1/2	2	1 1/2	1	3/4	1/2



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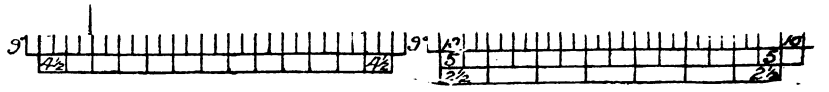

3 in.=1 mi. 0 4 8 12 16 20 24 2700 p. 27 in.

3 in.=1 mi. 0 4 8 12 16 20 24 2700 p. 27½ in.

3 in.=1 mi. 0 4 8 12 16 20 24 2600 p. 28 in.

3 in.=1 mi. 0 4 8 12 16 20 24 2600 p. 28½ in

3 in.=1 mi. 0 4 8 12 16 20 2500 p. 29 in.

3 in.=1 mi. 0 4 8 12 16 20 2500 p. 29½ in

3 in.=1 mi. 0 4 8 12 16 20 2400 p. 30 in.

3 in.=1 mi. 0 4 8 12 16 20 2400 p. 30½ in.

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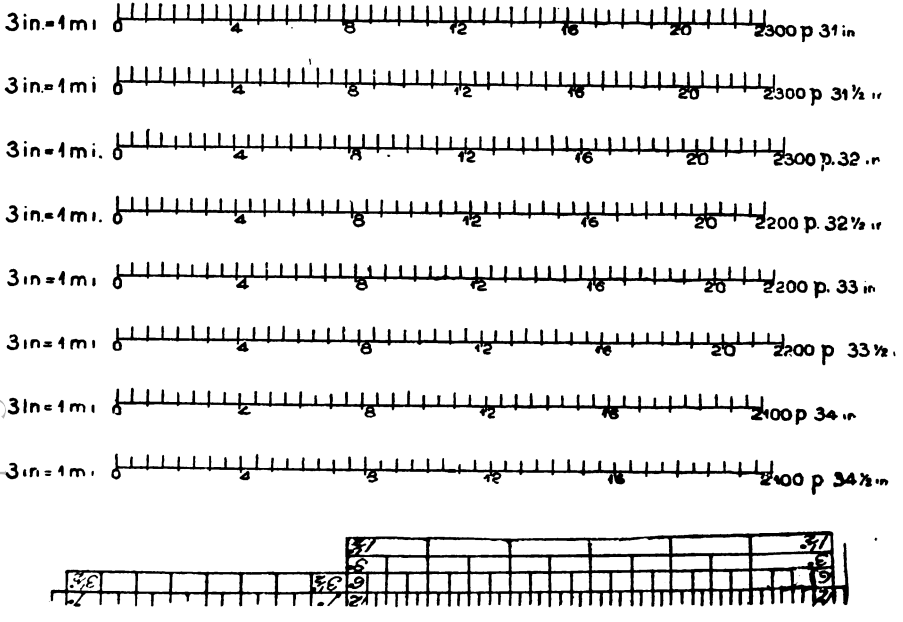
Scale of Paces.



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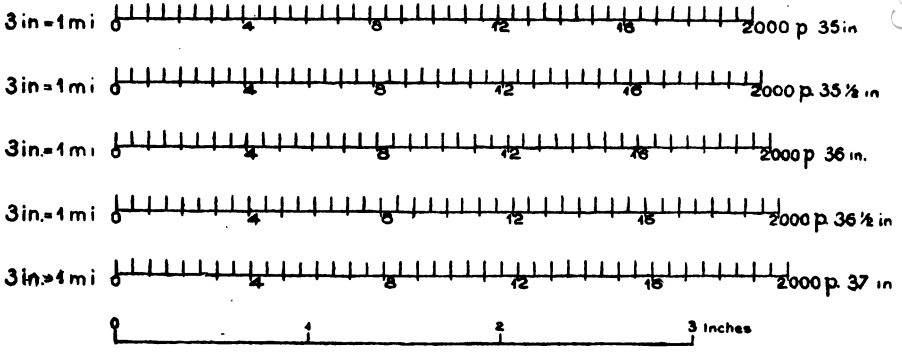
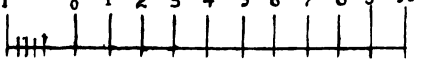


Hundreds of Yards. 3-in. = 1 Mile.



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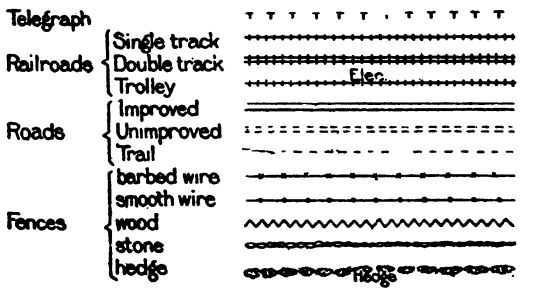
The following abbreviations are authorized for use on field maps and sketches. When these words are used they must be written in full or abbreviated as shown. The abbreviations must not be used for words other than those in the table. Words not in the table are not as a rule abbreviated.

abut.	abutment	P.O.	post Office
B.S.	blacksmith shop	Pt.	point
bot.	bottom	Q.	quarry
Cr	creek	q.p.	queen post
cul.	culvert	R.	river
cult	cultivated	R.H.	round house
d	deep	R.R	railroad
E	east	S.	south
f	fordable	s.	steel
gir.	girder	S.H.	school house
G.M.	grist mill	S.M.	saw mill
i	iron	Sta.	station
I.	island	st.	stone
jc.	junction	str.	stream
kp.	king-post	tres.	trestle
L.	lake	tr	truss
Mt.	mountain	W.T.	water tank
N.	north	W.W	water works
n.f.	not fordable	W.	west
p.	pier	wd.	wide
pk.	plank	w.	wood



(*Above from F. S. R.*)

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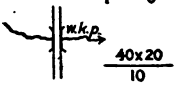
Bridge

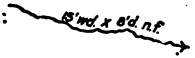
Indicate character and span by abbreviations.

Example: 

Meaning wooden king post bridge, 40 feet long, 20 feet wide, and 10 feet above the water

Streams

Indicate character by abbreviations.

Example: 

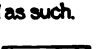
Meaning a stream 15 feet wide, 8 feet deep, and not fordable.

House ▪ Church ⁂ School house =S.H.

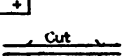
Woods

Orchards Cultivated Land Cult.

If boundary lines are fences they are indicated as such.

Brush, crops or grass, important as cover or forage 

Cemetery Trees, isolated

Cut and fill — 

cut 10 feet deep

fill 10 feet high

For more elaborate map work the authorized conventional signs are used.

(*Above from F. S. R.*)

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MAGNETIC DECLINATION.

Maps frequently have on them only one indication of North. This is generally the True North. Therefore, at times, it may be necessary to find the Magnetic Declination or difference between the True North and the Magnetic North in the locality in which you are operating.

To find the difference between the True North and the Magnetic North, in any locality.

Fig. 18.

The compass needle points to the Magnetic North. The deflection of the compass needle from the True North, or the Magnetic Declination, is different in different localities.

It can be found, roughly, any clear starlit night. Take two sticks, about 12 inches and 6 inches long respectively. Connect them by a string about 2 feet long, tied close to an end of each stick.

Drive, vertically, the longer of the sticks in the ground just far enough to hold it solidly. Lie down on the ground with this stick between you and north. Find the North Star. Hold the shorter stick, vertically, in front of you, so that the string connecting the two sticks is taut. Sight over the tops of the two sticks. Place them in line with the North Star, by moving the shorter stick. When this is accomplished, drive the shorter stick into the ground. Be careful not to disarrange the alignment.

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Place your compass with the pivot of the needle directly under the string. See that there is nothing present which will influence the needle, such as iron or steel.

The compass needle will point to the Magnetic North.

The direction of the string will be True North.

Read the difference in degrees between the direction of the needle and the direction of the string. This difference is the Magnetic Declination for the locality in which you made your observation.

Note.—The measurements of string and sticks were taken simply for convenience and their proportion has nothing to do with the problem.

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Appendix C.

QUESTIONS FOR AND AIDS TO INSTRUCTORS.

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QUESTIONS FOR INSTRUCTORS.

The following questions have been prepared with a view to their use during the indoor period of instruction in scouting. The number in parentheses indicates the page on which the answer to the question is to be found:

INTRODUCTION.

1. How is information gathered for the use of an army in the field? (Page 7.)
2. What information is gathered by the troops themselves in the field? (Pages 7-8.)
3. Why is the work of one scout important? (Page 8.)
4. What is the *mission* of a scout? (Page 9.)
5. What are the "Natural Qualifications" of a scout? (Page 10.)
6. What are the "Acquired Qualifications" of a scout? (Page 11.)

ASKING QUESTIONS AND READING SIGNS.

7. On what does the value of information obtained by asking questions depend? (Page 22.)
8. What should be avoided when asking questions of civilians? (Page 23.)
9. Mention some things to remember when asking questions. (Pages 23-24.)
10. Mention some of the examples given of incorrect and correct ways of asking the same questions. (Page 25.)
11. What does the Field Service Regulations forbid all persons in the military service to do, with or in the presence of, civilians? (Page 26.)

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12. What must be done in order to find out what signs mean? (Page 13.)

13. Discuss whether or not the same sign will always have the same significance. (Page 13.)

Note to Instructors.—By a reference to pages 14 to 22, inclusive, questions may be readily formulated as to the significance of certain signs.

ESTIMATING AND MEASURING DISTANCES AND HEIGHTS.

14. What are some of the conditions under which objects seem nearer? (Page 27.)

15. What are some of the conditions under which objects seem more distant? (Page 28.)

16. Give some methods of estimating distances? (Pages 28-30.)

*17. Demonstrate how to construct a right angle at the end of a line of sight. (Page 31.)

18. Demonstrate how to construct a right angle on a line of sight. (Page 32.)

19. Demonstrate how you can find the distance between any two points when it cannot be measured directly. (Page 33.)

20. Demonstrate how you can find the height of anything which cannot be measured directly. (Page 35.)

21. How can you find the height of a hill if you have a slope-board, a scale of map distances, and can pace in a straight line to the top of the hill? (Page 36.)

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*These demonstrations can be made with a pencil, paper, pin, and piece of string.

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TRAILING.

22. What are some plain indications of trails? (Page 37.)
23. What is trailing? (Page 38.)
24. Why is it not always best to look at each separate sign on the ground while following a trail? (Page 38.)
25. What should you do when you think you are "off the trail"? (Page 38.)
26. Where should you look for evidences of trails, in addition to looking on roads and paths? (Page 38.)
27. How may a track be followed on hard substances? (Page 39.)
28. How could you follow a trail at night? (Page 40.)
29. In daylight, when you cannot see a foot-print, how may a trail be picked up? (Page 40.)
30. Is it important to note droppings of animals? (Page 40.)
31. Why is a knowledge of the characteristics of objects, animals and persons a great aid? (Page 40.)
32. When only parts of tracks are seen, what should you be able to do? (Page 41.)
33. Mention some of the easiest surfaces and conditions which reveal the presence of trails? (Page 41.)
34. Mention some things which affect the appearance of trails. (Page 41.)
35. Mention some things to remember, when judging the age of trails. (Page 42.)

Note to Instructors.—Formulate questions by a reference to the alphabetical list on pages 43 to 52, inclusive.

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36. Describe the method by which a trail to be followed may be laid artificially. (Page 52.)

COVER AND OBSERVATION.

37. When should a scout be invisible? (Page 60.)

38 Why should your (the scout's) presence be kept a secret from the enemy? (Page 61.)

39. What are some of the greatest aids in avoiding detection? (Page 61.)

Note to Instructors.—Formulate questions by a reference to the alphabetical list on pages 61 to 67, inclusive.

40. Mention some of the "Don'ts" to bear in mind in order to avoid detection. (Pages 67 to 68.)

Note to Instructors.—Formulate questions by a reference to the alphabetical list on pages 69 to 74, inclusive.

41. How may you observe the enemy? (Page 74.)

42. How should you act if you suspected the presence of the enemy? (Page 75.)

43. What should you do if you think you have passed an enemy who is observing you? (Page 75.)

44. What does it mean if you feel that something has disappeared from a piece of ground or the landscape since you first saw it? (Page 75.)

45. What should you do if you are observed by a small detachment which shows no signs of immediately molesting you? (Page 75.)

46. If the detachment starts after you, what should you do? (Page 75.)

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47. What should you always keep the enemy doing? (Page 76.)

48. If you are captured, what will probably be the cause? (Page 76.)

49. What should you remember and what should be your conduct if captured? (Page 76.)

50. How may you do valuable work for your army, although a prisoner in the hands of the enemy? (Page 76.)

OBSERVATION AND COMPREHENSION OF MILITARY FEATURES.

51. How may you train yourself to see and comprehend, at at a glance, principal features coming under your observation? (Page 77.)

52. Of what benefit is a mental picture of the features on which you are reporting? (Page 77.)

53. How may you increase your powers of perception and value as a scout? (Page 78.)

54. Before arriving at your place of observation, what should you do regarding the military features of the subject upon which you are to report? (Page 78.)

Note to Instructors.—Formulate questions by a reference to the alphabetical list of military features on pages 78 to 95, inclusive. These features include special directions, which can be brought out by such questions as the following:

55. What features would you consider in selecting a camp-site? (Page 80.)

56. How may old fords be found? (Pages 85, 140.)

57. How may new fords be found? (Pages 85, 140.)

58. Describe good drinking-water. (Page 94.)

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59. What inspection should be made regarding the purity of water? (Page 94.)

60. How much water does each man require per day? (Page 95.)

61. How much water do horses, mules, and cattle require per day? (Page 95.)

62. Reports on what features should be accompanied by sketches? (Pages 79, 85, 86.)

63. Why should trivial things be noticed while making observations? (Page 96.)

MAKING ONE'S WAY ACROSS COUNTRY.

64. What should a scout consider a point of honor? (Page 97.)

65. When does a scout's training come into importance, and with what result? (Pages 97, 98.)

66. Mention a scout's best friends in the order of their importance. (Page 98.)

67. Discuss the importance of each of a scout's best friends. (Pages 98 to 101.)

68. What is the first requisite for knowing your own location or finding your way in a strange country? (Page 102.)

69. How can you determine the points of the compass by the sun? (Page 102.)

70. Describe two ways of finding the points of the compass by the use of the sun and your watch. (Pages 102, 103.)

71. In what way may the points of the compass be determined by the use of a map of the country? (Page 104.)

72. How can you determine the points of the compass by the stars? (Page 105.)

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73. What physical conditions will give an idea of the general direction of the points of the compass? (Pages 105, 106, 107.)
74. What features of a territory should be looked for and their relation to the points of the compass noted? (Page 107.)
75. What is meant by orienting a map? (Page 108.)
76. Why is it necessary to orient a map in order to read it correctly? (Page 109.)
77. Are military maps necessarily correct at the time they are issued? (Page 109.)
78. Why should reports be supplemented by sketches? (Pages 109, 110.)
79. How may a scout supply himself with maps? (Page 110.)
80. Describe how practice in map-reading may be obtained? (Page 111.)
81. Upon what does the choice of routes depend? (Pages 111, 112.)
82. A scout should be in possession of what information before starting on actual scouting duty? (Page 112.)
83. How must a scout travel, in regard to the articles he carries when actually scouting? (Page 113.)
84. Mention all the articles which should be taken by a scout when actually scouting. (Page 113.)
85. Before starting out in a strange country, what should be noted? (Pages 114, 115.)
86. As you go forward through a strange country, what should be noted? (Page 115.)
87. What should you consider, if features not on your map appear on the ground, and *vice versa?* (Pages 115, 116.)

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88. If you have lost your way, what should you do? (Page 116.)

MEANS AND METHODS OF REPORTING.

89. How is information transmitted? (Page 118.)

90. When should mounted messengers at "Urgent" speed be used in preference to sending messages by wire?" (Page 118.)

91. What instructions should a mounted messenger receive? (Page 119.)

92. Describe the use of envelopes enclosing messages carried by messengers. (Page 126.)

93. What rate of speed is meant when messages are marked with the following words: "Ordinary," "Rapid," and Urgent"? (Page 119.)

94. What does the recipient of a message enclosed in an envelope do? (Page 120.)

95. When the dangers of the road are great and there is danger of a message falling into the hands of the enemy, what is done? (Page 120.)

96. When the usual means of communication cannot be established, how may it become necessary to send messages? (Page 120.)

97. Why should reports relating to the terrain, positions, ranges for fire, etc., be accompanied by sketches? (Page 121.)

Note to Instructors.—Formulate questions from the Rules for Reporting on pages 121 to 124, inclusive.

98. What should you do in making a personal verbal report? (Page 124.)

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99. Describe how verbal messages sent by another man should be worded. (Page 124.)

100. What things will have to be taken into consideration when it is necessary to find an officer marching with a column? (Pages 124, 125.)

101. What four things are laid down in this book to be observed regarding sending written messages? (Page 125.)

102. Describe the "Field Message Book U. S. Army." (Pages 125 to 128.)

103. Describe the envelope used for enclosing field messages. (Page 126.)

104. Can sketches be sent by wire? (Page 129.)

105. Describe the method of sending by wire a sketch which is not plotted by the scout. (Page 129.)

106. Describe the method of sending by wire a sketch which is plotted by the scout. (Page 130.)

APPENDIX A.

The contents of Appendix A are primarily for reference. However, it contains some data with which every scout should be familiar. The following questions have been prepared with a view to emphasizing the data mentioned:

107. Describe the method by which the velocity of a current may be determined. (Page 138.)

108 Give the definition of "detachment." (Page 138.)

109. Describe the method by which distance may be measured by time and gaits. (Pages 138, 139.)

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110. What articles are essential to the work of a scout? (Pages 139, 140.)

111. What are the practicable depths of fords for the following: cavalry, infantry, artillery, and wagons? (Page 140.)

112. How may fords be marked? (Pages 140, 141.)

113. What is the "Standard Gauge" of railroads in the United States and most foreign countries? (Page 141.)

114. How may the amount of grain in pounds and hay in tons be estimated? (Pages 141, 142.)

115. What thickness of ice will support the following: small groups of men, cavalry and light guns, heavy guns? (Page 144.)

116. Define the "Military Crest." (Page 147.)

117. How may the strength of passing troops be estimated? (Page 149.)

118. How can you calculate the amount of water in a dug well? (Page 150.)

119. Describe the significance of blasts of locomotive whistles which apply to scouting. (Pages 150, 151.)

120. How can you estimate the amount, in cords, of a pile of wood? (Page 151.)

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AIDS TO INSTRUCTORS.

EXERCISES READILY SUGGESTED BY THE TEXT.

By referring to the pages set opposite the subjects below, it will be found that exercises are readily suggested by the text.

Subjects.	*Page.*
Estimating Distances	27
Constructing Right Angles	30
Measuring Distances Which Cannot Be Paced	33
Measuring Heights	34
Laying a Trail	52
Finding and Marking Old and New Fords	85 and 140
Selection of Camp Sites	80
Inspection of Drinking Water	94
Finding the Points of the Compass	102 to 108
Taking Trips on Maps	111
Finding the Velocity of a Current	138
Distances Measured by Time and Gaits	138
Use of Signals by Scouts	148
Estimation of Strength of Troops Passing	149
Calculation of Amount of Water in a Dug Well	150
Finding the Magnetic Declination	161

EXERCISES ON PRACTICE MARCHES.

When on practice marches, instruction may be given in the following subjects:

Subjects.	*Page.*
Asking Questions	22
Use of Maps	108
Leading the Command	52
Trailing	37
Finding the Points of the Compass	102 to 108
Carrying Messages	119
Selection of Camp Sites	80
Inspection of Water	94
Finding and Marking Fords	85 and 140
Estimation of Distances Traveled by Time	138

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